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YEAR BOOK ISSUE

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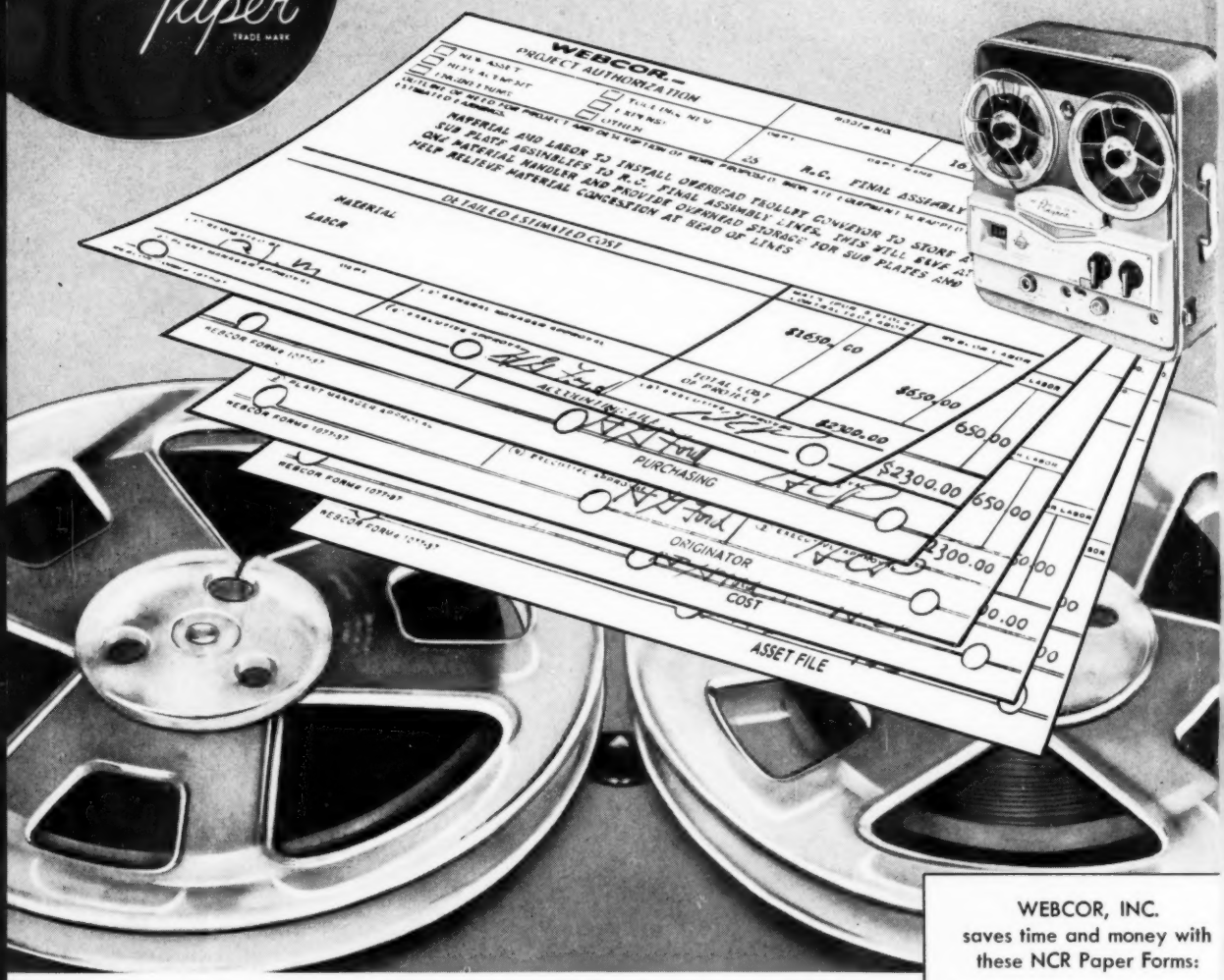

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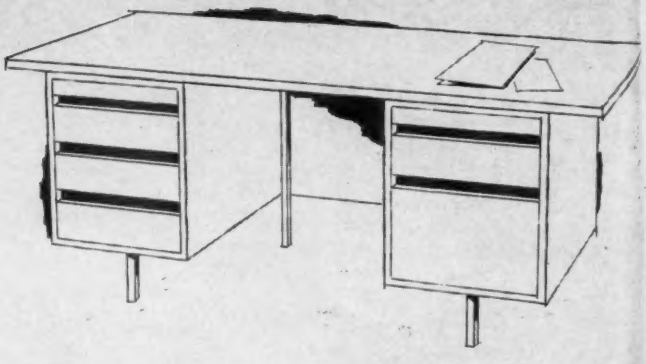

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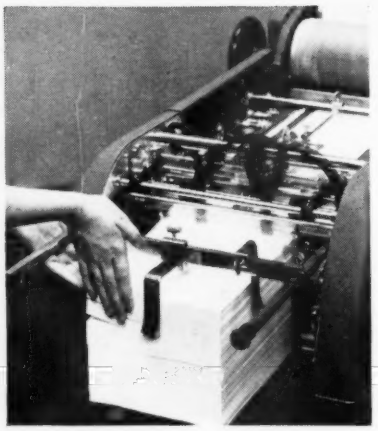

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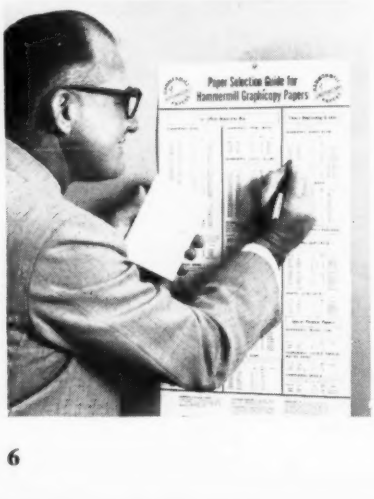

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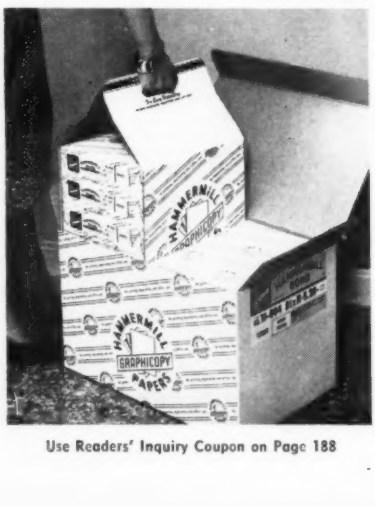

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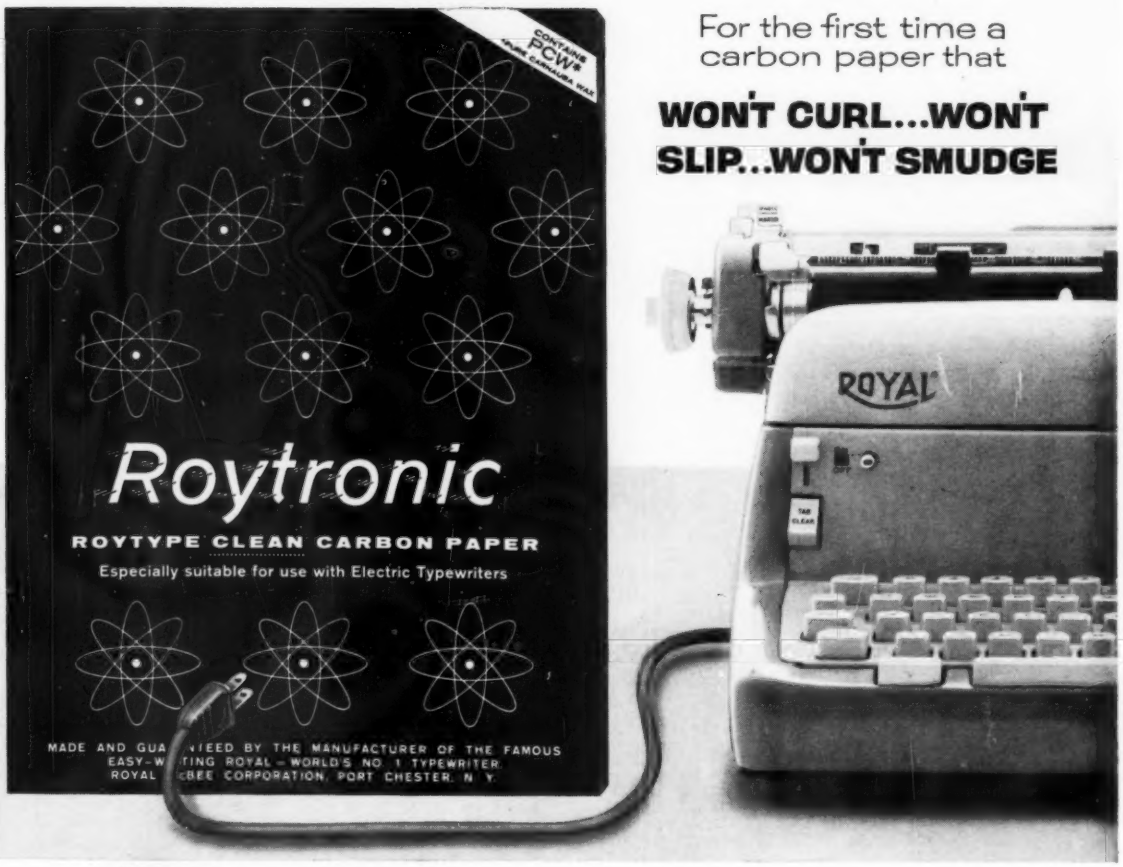
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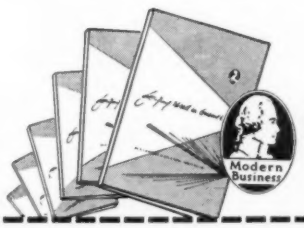

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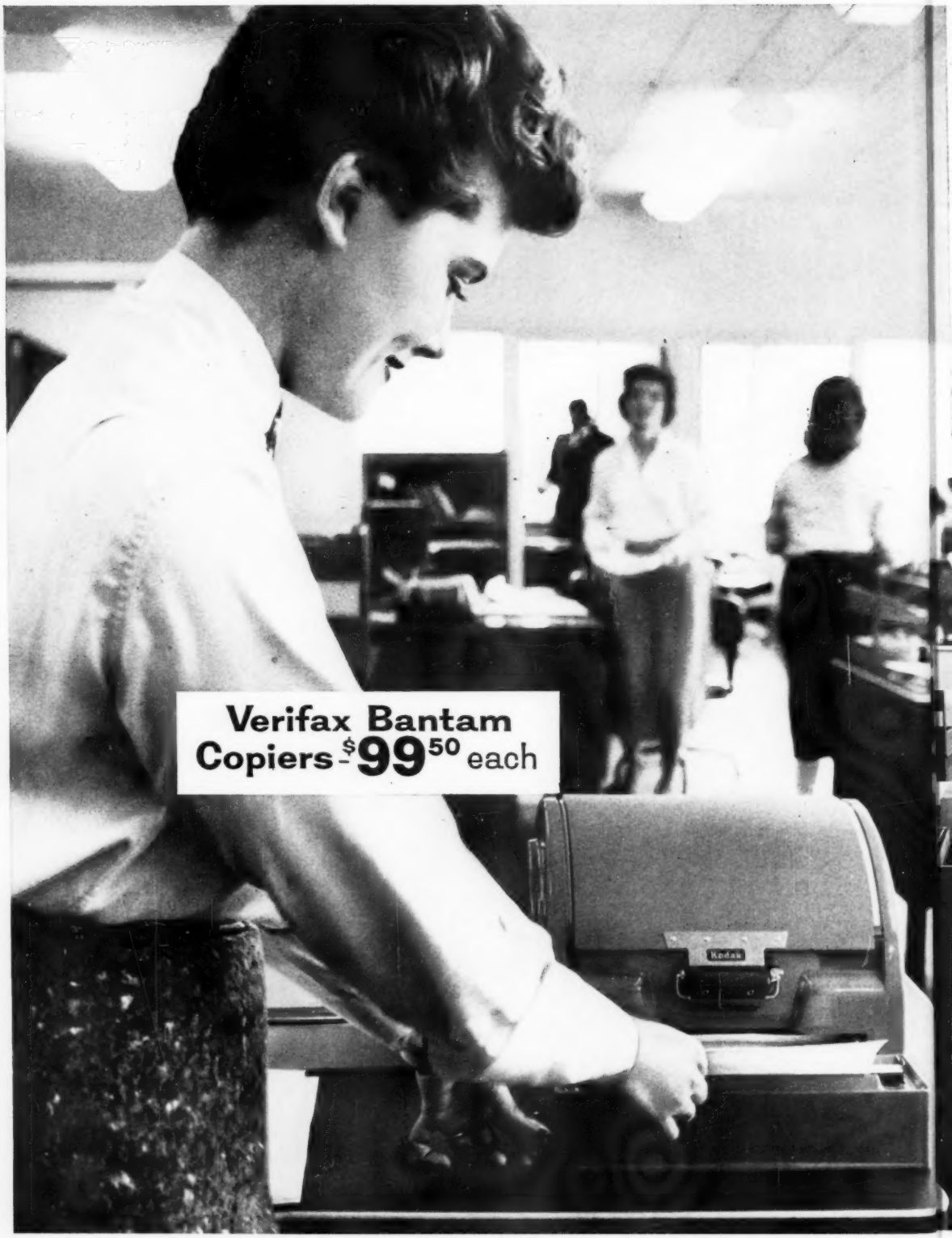

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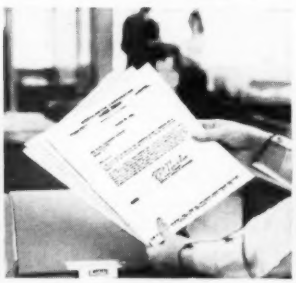

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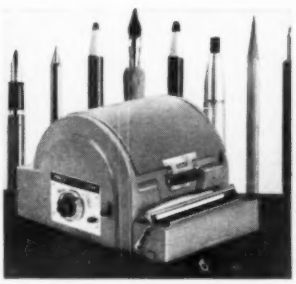

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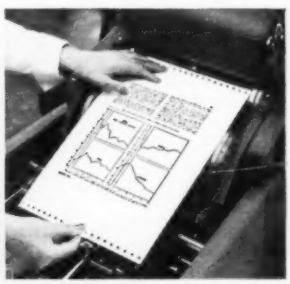

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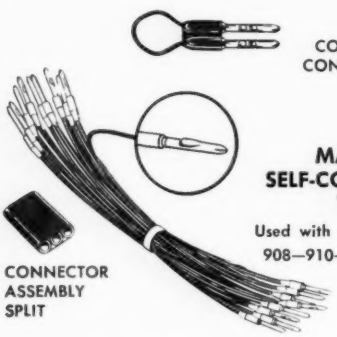

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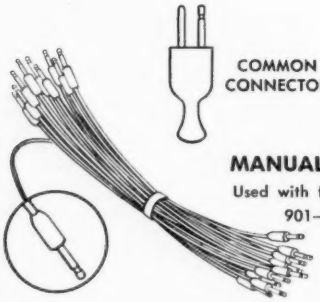

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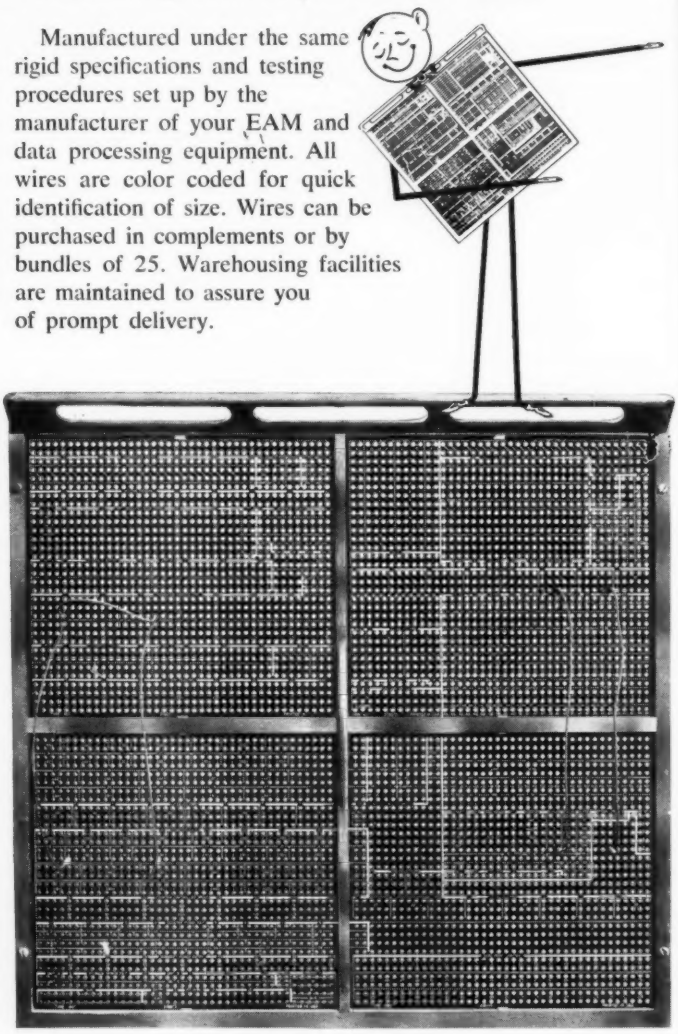

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AUTOMATION
IN THE OFFICE

Year of assessment

The caution that has gripped many companies as a result of the '57-'58 recession has definitely affected the spread of the concept of office automation. Aiding this reaction against an earlier overenthusiasm was the discovery that "automation" could never be a ready-made solution to all operating problems. In this section are presented some of the difficulties — and some of the solutions found for those difficulties — involved in achieving automation in the office.

Effects of recession still felt in current trends in automation

Systems improvements made under pressure of recession, reluctance to invest in new equipment, are slowing pace of automation—

by Robert M. Smith
Editor, *Office Management*

A FEW WEEKS ago in New York City, a long line of longshoremen paraded before the docks bearing all the standard impedimenta of the picket line. They were not protesting the "shape up," harsh working conditions, low wages—any of the troubles that have historically made men working at a hard, uncertain, and poorly paid vocation the instigators of violent strikes.

They were instead protesting job elimination caused by automation of ship loading and unloading.

It is ironic, perhaps, that the first organized reaction on the part of workers against automation should have pitted people working at one of the most unskilled occupations in the labor category against the sophisticated technique which so many workers have feared all along.

But the longshoremen's demonstra-

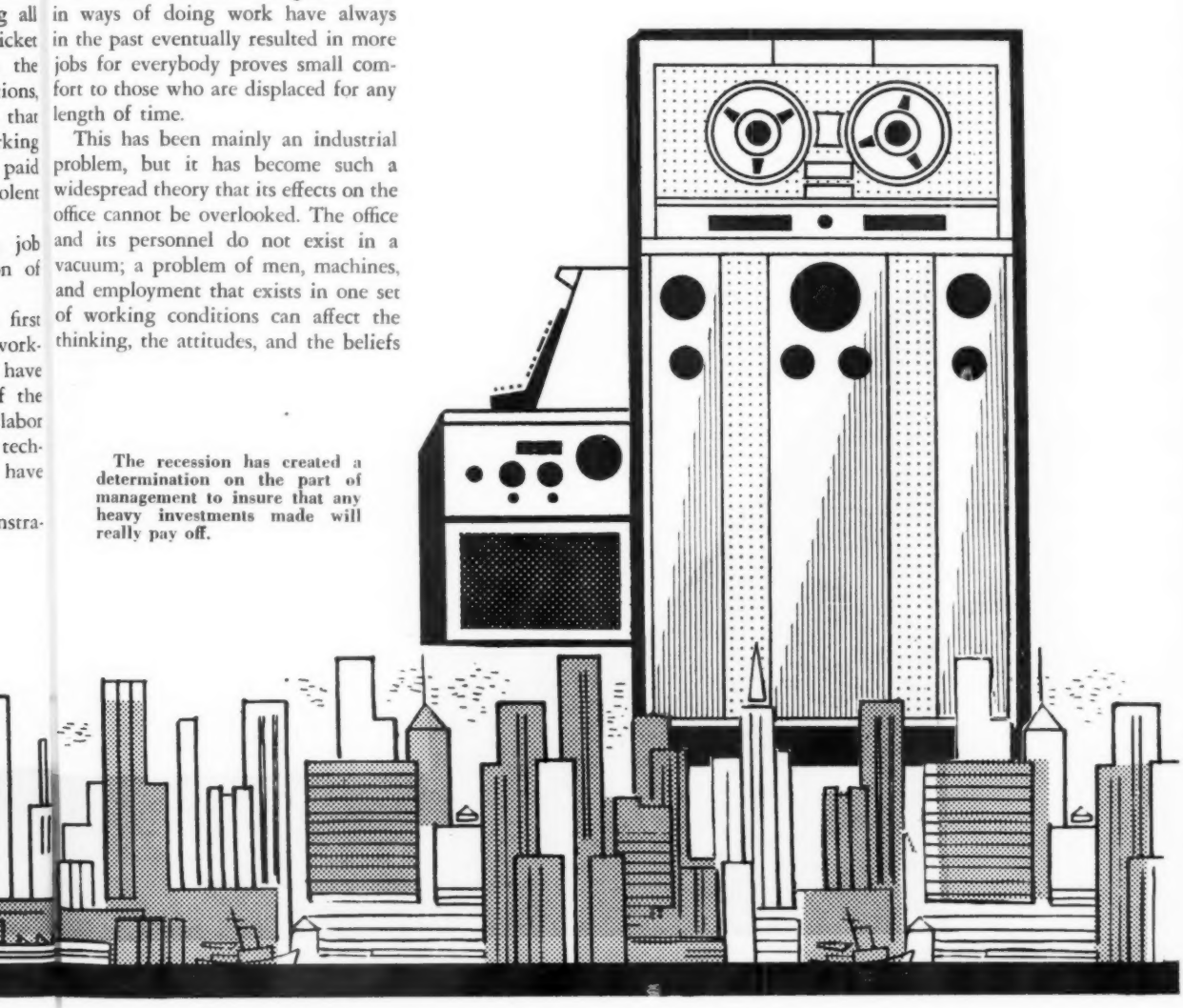
tion also gave form to a feeling which has been growing stronger among workers through the first months of recovery following the '57-'58 recession: the belief that the reason unemployment figures remain one area where there are few signs of the recovery that is pushing other business indices up is that improved machines and techniques in industry have made it possible for companies to expand their output as business has improved, without rehiring workers laid off during the recession.

The ugly spectre of technological unemployment, always frightening to workers even in a period when jobs are plentiful, has taken on an apparent reality during months when men and women have been laid off their jobs. The fact that mechanical improvements in ways of doing work have always in the past eventually resulted in more jobs for everybody proves small comfort to those who are displaced for any length of time.

This has been mainly an industrial problem, but it has become such a widespread theory that its effects on the office cannot be overlooked. The office and its personnel do not exist in a vacuum; a problem of men, machines, and employment that exists in one set of working conditions can affect the thinking, the attitudes, and the beliefs of those who work in very different circumstances.

This is a secondary possible reason, besides the very obvious one that many companies were running scared during the first six months of last year, and were not investing in expensive new machinery for the office, to explain the definite slackening of the pace of office automation that characterized late 1957 and most of 1958.

One of the most delicate problems that has faced each company considering an electronic data processing installation, for instance, has been the prospect of selling the idea to its employees. Such installations do have as their primary object the mechanical performance of tasks formerly done by human beings, or tasks at least performed by individual machines controlled by human beings. After an electronic data processor has been installed, and is performing successfully, there is bound to be at least some displacement of employees, even though in most instances the companies concerned have made a point of transferring such employees to new duties. The company guarantee that no one would lose employment through an electronic installation, even though he might be given a different job, was always the most compelling argument in soothing employee fears of "automation." But with a recession on, a recession which, even though it did not affect the office nearly as much as it did the factory, certainly had its effect on the thinking of office personnel, such company re-



The recession has created a determination on the part of management to insure that any heavy investments made will really pay off.

assurances would have been received with a far greater cynicism.

And even though recovery now seems well on its way, the very strong and very widespread feeling — which is shared by some responsible economists — that improvements in mechanical efficiency and automation techniques have been responsible in large part for the failure to rehire production line workers as factory output has gone up will handicap an office in persuading its employees that electronic installations threaten no one's job.

Just how much effect this has had on the plans made by offices during the past year is a moot point, but it certainly has influenced the rapidity with which office automation has progressed. Strangely enough, the experts, even on the side always biased toward workers' interests, believe that automation in the office, as against automation in the factory, will lead to an expansion of the total number of jobs, rather than a contraction.

Thus, union economists, advising their groups that white collar workers must be organized if the unions are to retain and extend their present membership strength, make two definite assumptions: the proportion of basic production line workers in the economy will continue to contract; the proportion of clerical and service workers will continue to grow. As far as the best union planners can see, automation in the office will not seriously cut the number of office workers; it will, if anything, tend to increase office jobs.

Of course, most significant of all in the definite diminishment of emphasis on automation this year was management reluctance to invest heavy sums in the systems changeover and expensive equipment involved in automation, at a time when company profits were decreasing. Even though profits now are rising again, the very real effect of a sudden, sharp recession, following as it did on years of prosperity, has reawakened in many offices feelings of caution which had almost been forgotten in the previous years. Moreover—and this is very healthy—it has created a determination to insure that there is some degree of certainty that any expensive investments made will really pay off.

Many of the early computer installations made back in 1954 and 1955 were not adequately planned. As a result, companies found they were spending a great deal more money than they had ever anticipated, and getting far less in return than they had confidently expected. So, there was a certain amount of disillusionment and cynicism about electronic installations generally, which came as a natural reaction to the first wave of overenthusiasm. The effect of a sudden reassertion of business realities coming on top of such a reaction was to slow perceptibly the pace of automation, at least as far as electronic data processors were concerned.

This is, of course, true mainly of companies which may have been considering, but which had taken no concrete steps toward, installing electronic data processing techniques. Systems conversion for, and installation of, a large electric data processor is a bit like total mobilization; once the process is really under way, it's much easier to complete it than to reverse it.

Costs analyzed intelligently

Moreover, one notable difference between the recession just ended and previous ones was the more intelligent approach taken by most managements to cost cutting techniques. The old stand by: "cut ten per cent across the board" as a solution to falling profits was invoked far less frequently than ever before. A serious attempt to identify and eliminate unnecessary procedures and activities that didn't contribute anything significant to the company's work—and in some instances, may even have hindered it—was far more common than ever before.

Under this type of analysis, many a company found to its astonishment that it had been "leaking" money for years, in terms of wasteful procedures, superfluous employees, forms and reports that were not only unnecessary, but actually served to clutter the company communication lines.

And one of the ancient truisms that has accompanied every report of a successful electronic data processing installation has been the emphasis on the fact that it is the systems revisions that must precede such an installation that gives a company its true immediate savings. The break even point for the electronic equipment itself lies far in the future, and many of its benefits—better management information faster,

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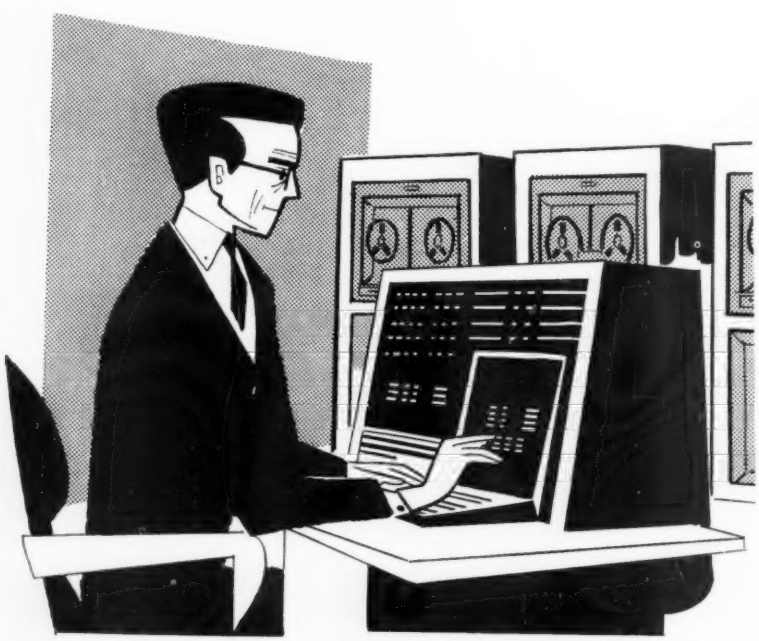
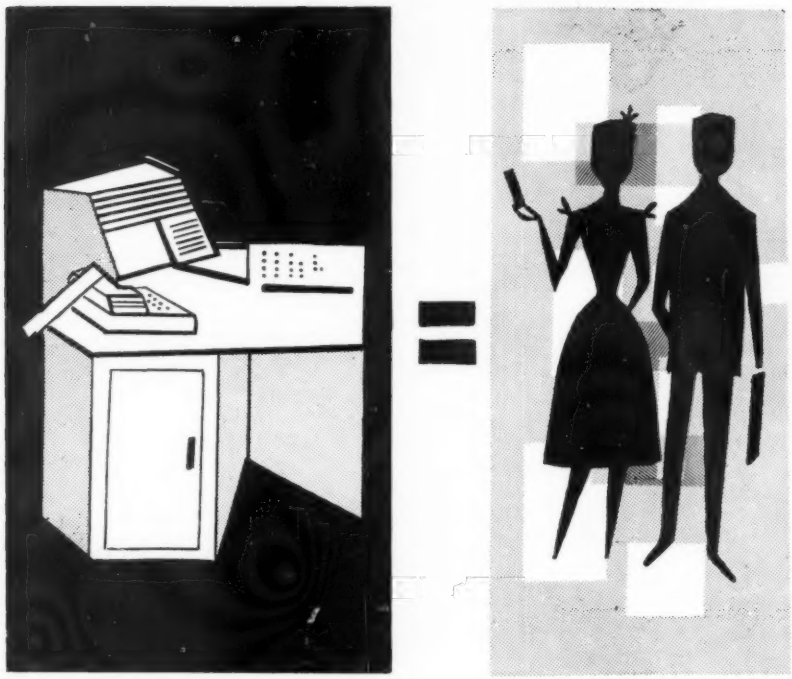


Development of automatic programming techniques would increase computer flexibility and utility



Down time, set up time, debugging time, return time—
all depend on people, rather than machines.

How to control the hidden costs of an electronic data processing installation

Too many companies, while alert to the costs of preparing for an electronic data processing installation, don't know how to control costs once a computer has been installed—

by Ralph E. Weindling

RUNNING a computer center has been treated as a poor orphan in the literature on automatic data processing. A great deal of attention has been devoted to the merits, or pitfalls, of computers as management tools, and the work involved in planning and preparing for a computer has been the subject of books, articles, courses, and talks. But somehow there has been very little concern about what happens when the computer actually arrives.

In this respect, the literature very closely resembles the actual situation in business. As a result of extensive educational efforts, there is by now a general realization that computers cannot be plugged in and switched on. Management takes an interest in system studies and in planning for the computer. As a matter of fact, the emphasis on costs and difficulties—so necessary to take the "romance" out of automatic data processing—has made some managements excessively careful and skeptical. But in spite of all this interest in feasibility studies and initial work programs, the situation changes as soon as the real work begins with the arrival of the computer. Achievements in the early phases of operation are discussed in terms of the "number of hours of running time per day" with very little attention given to what is being accomplished in these hours, or what the cost of the achievement has been. But even this criterion is better than the complete neglect that is frequently evidenced.

Such a situation is surprising in view of the huge expense item that a computer center represents. A production machine of similar cost would be obtained if there were a real need for its output and, once obtained, its performance would be very closely watched. Success would not be measured in terms of number of hours of operation; the criterion would be amount of production. There are many reasons for a different attitude toward computers, and some of them are very sound reasons. Many, however, are not.

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The first reason, and the most obvious, is that a computer is the focal point of a vast system of data processing, and the great bulk of its most valuable output is information that cannot be measured in tons or number of items, or even in dollar value. In many cases, a computer's job is to do things that have not been done before. This obviously rules out cost comparisons with an "old method." New concepts are required to obtain full value from an automatic data processing system, and perhaps some of the least successful installations are those in which the computer system shows "tangible cost savings" instead of intangible results in the form of new and better information. But this is an old story that has been covered frequently in considering computer feasibility.

There are other reasons for management's "hands off" policy in relation to going computer centers. Perhaps the most important of these is that management just has not had the first hand experience with computers that it has had with nearly every other aspect of its organization. Very few of today's managers have had actual operating experience with a data processing center, experience of the type that they have had in sales or production or accounting. As a result, it is hard to exercise close control over an area that is still something of a mystery, in its actual operation if not in its results. This should not be an obstacle to control, but it very frequently is. Presumably, this situation will be overcome in time, but not necessarily. Personnel policies have not yet been established that include the computer as a "tour of duty" for future managers, and the future of the automatic data processing manager as a candidate for higher management positions is rather nebulous in most organizations.

The high value and intangible nature of computer results also explain a non-critical attitude toward costs. In those cases in which a computer has really justified itself, the value of its results is far above any costs that may be involved in its operation. The most obvious example, although by no means the best, is the automatic data processing system that has more than paid for itself in personnel savings and has left "extra time" for other work. It seems rather small to worry too much about whether each minute of this extra time is being used to full potential. It is like worrying about the number of pencils consumed in an extremely profitable business, except the actual costs are much higher than pencils.

In one case, high value of results has led to a deliberate policy of "overstocking" on computer time. Computers are used to calculate bids on contracts, and these bids must often be prepared quickly. The value of the contracts is so great, and the value of obtaining quick, accurate calculations is so great, that rental on large scale computers is considered relatively insignificant in comparison.

Perhaps the main reason for an inability to control computer costs is the lack of any sound basis of comparison. Even historical records are rare and unreliable because the entire field is so new. In this context, there is a rather interesting consequence arising from management's caution to enter the automatic data processing field, a caution that has only recently replaced some rather pronounced overenthusiasm. In evaluating the feasibility of computers, operating costs have been exaggerated to allow for all sorts of contingencies. The result is an inflated budget for the computer center that is very easy to meet, but which certainly does not serve as a control.

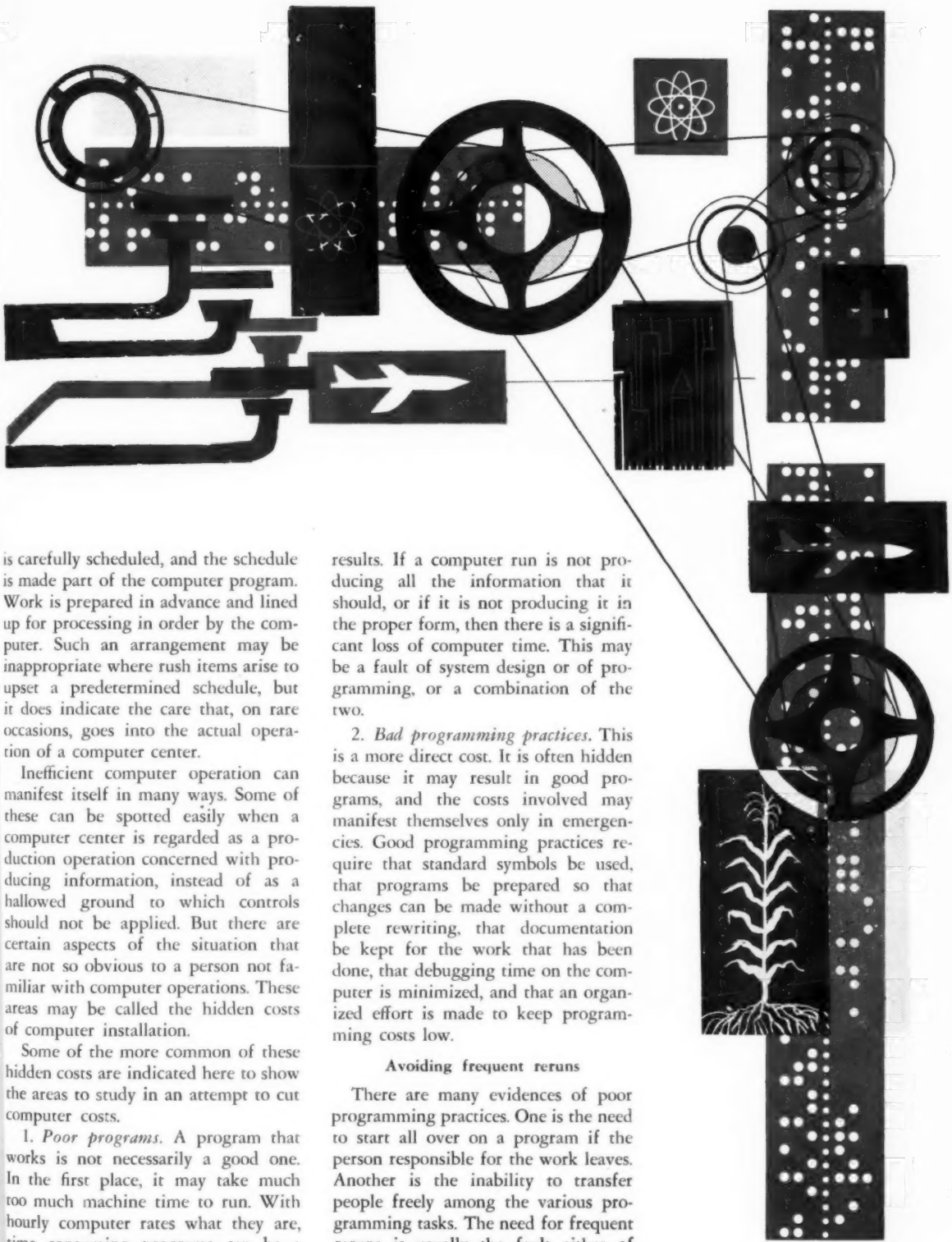
But more than unconsciously inflated budgets, the lack of standards is a real cause for concern. If it is impossible to foresee how much a programmer should produce, or how long an application design should take, then it is impossible to draw valid conclusions on efficiency. Computer operations are by no means entirely controlled by machine capability. In most installations, machine costs are about 50 per cent of total costs, and there is certainly nothing fixed about a programmer's output. Even machine time, and therefore cost, is subject to control. Down time, set up time, debugging time, rerun time all depend on people, not machines. What is needed is some method for setting standards that should be met, and setting up strict control procedures to see where deviations occur, and why.

There is certainly nothing startling about standards in business. They have been the basis of the scientific management movement, and they have been applied to a great many extremely complex operations. Computer and data processing activities should be no exception. Standards can be developed on the basis of historical information, on the basis of study and analysis, and on the basis of comparison with other installations. The automatic data processing field is by no means so small that there are not a great many sources for information. In many cases, informal standards exist. When a supervisor estimates the amount of time that a certain program will take to prepare, he estimates on the basis of some standard. But in hardly any instances is there a formal system for following up on the estimate and investigating deviations from it.

There are some data processing centers that are extremely well run. There are even some that are over-controlled. One extremely effective operation treats the computer as the production operation that it actually is. Machine time

These are six common factors leading to unnecessarily high computer costs:

1. **Poor programs. A program may work—and still not be a good program.**
2. **Bad programming practices. Good individual programs may be evolved, but if changes involve complete re-writing, if symbols are not standardized, if there is too much debugging time, poor practices are being followed.**
3. **Unprofitable applications. Anything done on a computer that can be done equally well and at less cost any other way is a waste of money.**
4. **Too much—or too little—equipment. In either instance, a company stands to lose money. In the first case it's investing more than it needs to start with. In the second, it's investing a lot of money, but not getting the real value from its processor that it could by spending just a little bit more.**
5. **Inexpensive people. Since people represent so large a factor in the total cost of a computer installation, it doesn't pay to employ any but the best.**
6. **Inadequate preparation. Putting any application on a computer before it has been thoroughly prepared for computer processing is wasteful—and futile.**



is carefully scheduled, and the schedule is made part of the computer program. Work is prepared in advance and lined up for processing in order by the computer. Such an arrangement may be inappropriate where rush items arise to upset a predetermined schedule, but it does indicate the care that, on rare occasions, goes into the actual operation of a computer center.

Inefficient computer operation can manifest itself in many ways. Some of these can be spotted easily when a computer center is regarded as a production operation concerned with producing information, instead of as a hallowed ground to which controls should not be applied. But there are certain aspects of the situation that are not so obvious to a person not familiar with computer operations. These areas may be called the hidden costs of computer installation.

Some of the more common of these hidden costs are indicated here to show the areas to study in an attempt to cut computer costs.

1. *Poor programs.* A program that works is not necessarily a good one. In the first place, it may take much too much machine time to run. With hourly computer rates what they are, time consuming programs can be a real cost factor. They can be even more expensive when their use of excessive computer time prevents additional applications from being placed on the machine. Secondly, poor programming may mean high costs in terms of poor results. If a computer run is not producing all the information that it should, or if it is not producing it in the proper form, then there is a significant loss of computer time. This may be a fault of system design or of programming, or a combination of the two.

2. *Bad programming practices.* This is a more direct cost. It is often hidden because it may result in good programs, and the costs involved may manifest themselves only in emergencies. Good programming practices require that standard symbols be used, that programs be prepared so that changes can be made without a complete rewriting, that documentation be kept for the work that has been done, that debugging time on the computer is minimized, and that an organized effort is made to keep programming costs low.

Avoiding frequent reruns

There are many evidences of poor programming practices. One is the need to start all over on a program if the person responsible for the work leaves. Another is the inability to transfer people freely among the various programming tasks. The need for frequent reruns is usually the fault either of the program or of the input data. The computer itself is seldom responsible. If changes in output requirements occur, it is often necessary to start the program all over again, but good program writing can often avoid this. As a result, the need to rewrite programs each time a change occurs is a sign of possible inadequacy.

3. *Unprofitable applications.* This can be one of the most costly areas,

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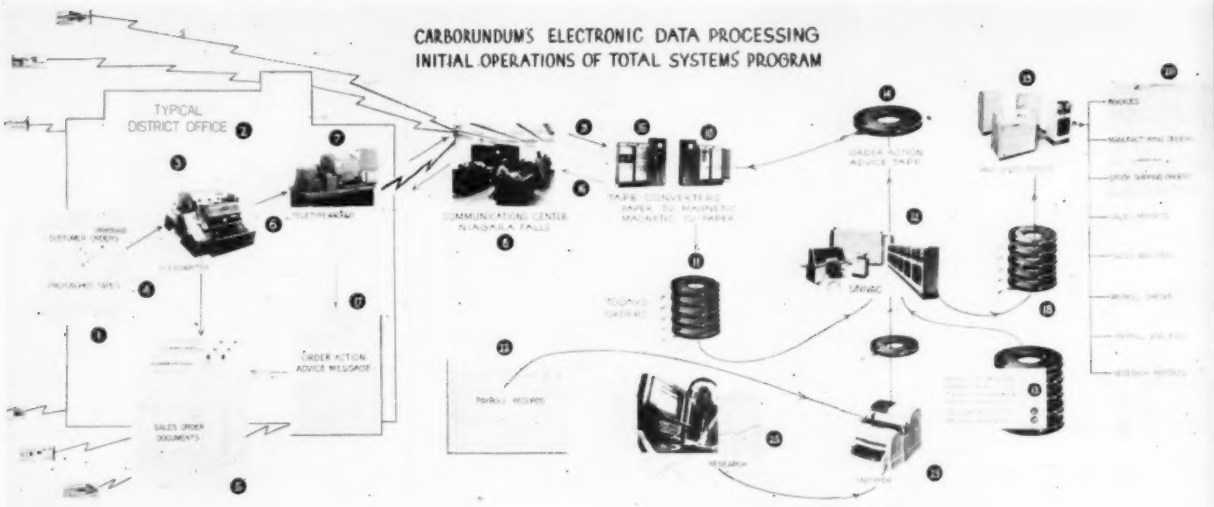

Carborundum Co. develops "Total Systems Approach" in data processing

Believing that all company documents and actions stem from the sales order, Carborundum has automated entire order processing sequence for three divisions—

An *Office Management* Staff Report

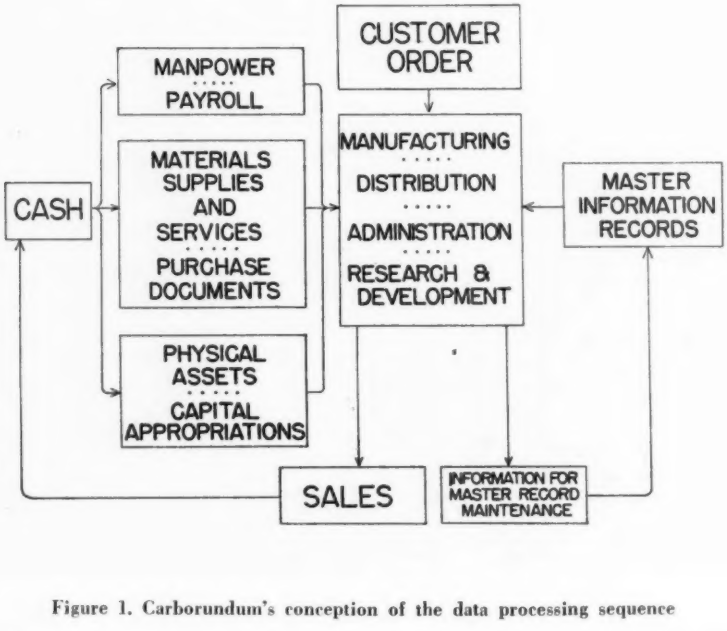

Figure 1. Carborundum's conception of the data processing sequence

ALL OPERATIONS in the typica manufacturing company are the resul of a customer order.

That was the simple basic philos ophy followed by the Carborundum Company, Niagara Falls, N. Y., when it began three years ago to set up its "Total Systems Approach" to elec tronic data processing.

The need for such an approach wa the result of findings made by Genera Clinton F. Robinson, Carborundum president, following his assumption of the top company office in 1952. The new president found that Carbo rundum administrative costs were ris ing, and had been for years—to the point where they were seriously com promising the company's profit pic ture. Moreover, all managerial level throughout the company were com plaining that they were handicapped by lack of enough information, and timely information.

And most serious of all, in Robin son's eyes, Division General Manager were making their decisions very often by intuition and guesswork, because of a lack of sufficient information, and because of a lack, too, of the proper overall system of control necessary to operate the company.

These were the main reasons behin

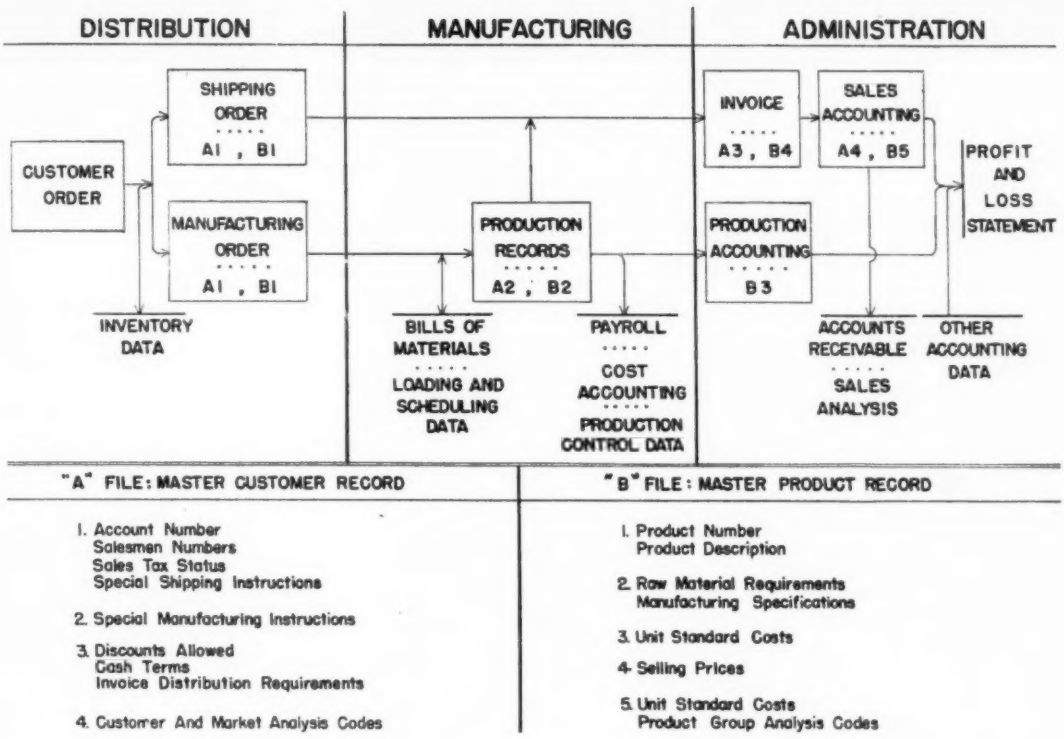

Figure 2. As the customer order "flows" through the company, each necessary action resulting from it requires two basic categories of stored information: product data and customer data.

Carborundum's decision to investigate the possibilities of electronic data processing: rising administrative costs; the need for fresher and more complete information; lack of overall company controls.

Up to that point, it was a conventional enough decision. The distinction between Carborundum's development of its electronic data processing system and that of other companies was that Carborundum was determined from the first to have a completely integrated system, rather than employ electronic data processing facilities for one or two isolated applications.

Basic source document identified

And to do this, it first identified as the source of all company operations and all company paperwork, the basic document which activated everything else—the sales order. From the sales order, Carborundum planners reasoned, stemmed the other basic source documents which are the origin of the whole administrative and processing cycle of the company—the documents that purchase materials, the documents that purchase labor, the documents that purchase assets.

After investigating the facilities offered by major electronics manufacturers, the company was convinced that the necessary machines to fit the systems approach Carborundum planned to develop were either already available or could be created. It was also decided, however, that the system plan into which the machines would be fitted would have to be developed mainly by company personnel, with the possible help of disinterested outside specialists. Since Carborundum had long had close relationships with the Mellon Institute of Industrial Research in Pittsburgh, its cooperation was sought and obtained for development of the "Total Systems" plan. A working group of five people—three methods and procedures men and two Mellon Fellows—was created to analyze Carborundum's work, and determine whether a completely integrated data processing system, based almost entirely on a few basic source documents, was possible, and — assuming that it was — if it would help to meet the company's three main problems.

In its preliminary studies as to how its three major objectives could best be achieved, the study group classified all business data processing into two major categories:

1. The processing and/or production of operating documents, records and reports; and
2. The preparation of management control information through data reduction and analysis.

Savings made a condition

Although realizing that the second function would ultimately justify electronic data processing far more than the first, the group decided that the first function would have to be completely mechanized before the second could be achieved. It decided, too, that any system evolved must promise a definite overall savings in terms of routine data processing alone.

With these objectives and definitions in mind, the group began its study of the company's operations, charting existing procedures through all the company's major paperwork

SOURCE DOCUMENT CODING AND MASTER FILE CLASSIFICATION

CUSTOMER	FIXED (F) VARIABLE (V)	ALPHABETIC (A) NUMERIC (N) COMBINATION (C)	DIGIT LIMITATION
ITEM NO.			
1. ACCOUNT NUMBER	F	N	7
2. DATE OF ORIGIN	F	N	6
3. NAME	V	C	60
9. ORDER NUMBER	V	C	24
10. SALES TAX CODE	F	N	2
11. TRANSPORTATION CODE	F	A	3
12. CITY - LOCATION CODE	F	N	3
17. DISCOUNT CLASS	F	N	2
31. SALESMAN CREDITED	F	N	5
33. OUR ORDER NUMBER	F	N	8
PRODUCT			
ITEM NO.			
1. PRODUCT NUMBER	F	N	9
2. NAME	V	A	24
3. TYPE	V	C	6
4. SHAPE	V	A	6
5. SIZE	V	C	25
10. PAYMENT TERM	V	C	18
11. UNIT OF MEASURE	F	A	2
12. SELLING PRICE	F	N	10

Figure 3. Basic "bits" of information for system were each classified in this way

SOURCE DOCUMENT CODING AND MASTER FILE CLASSIFICATION

	CUSTOMER				PRODUCT			
	ITEM NO. 1 ACCOUNT NO.		ITEM NO. 31 SALESMAN		ITEM NO. 1 PRODUCT NO.		ITEM NO. 12 SELLING PRICE	
(COMPUTOR) MASTER MAGNETIC TAPE (CENTER)		X		X		X		X
(DISTRICT) MASTER PAPER TAPE (OFFICE)		X				X		
CARD RECORD (DISTRICT OFFICE)		X				X		
DISTRICT ORDER ABSTRACT	A	X			A	X		
DISTRICT SALES ORDER	P	X			P	X		
DISTRICT ORDER TAPE	P	X			P	X		
DISTRICT SHIPPING ABSTRACT								
DISTRICT SHIPPING TAPE								
DIVISION MANUFACTURING ORDER TAPE	M	X	M	X	M	X		
DIVISION MANUFACTURING ORDER	M	X	M	X	M	X		
DIVISION SHIPPING ABSTRACT								
DIVISION SHIPPING TAPE								
INVOICE	M	X	M	X	M	X	M	X

A = RECORDED MANUALLY ON SOURCE DOCUMENT.

P = RECORDED ON MASTER PAPER TAPE.

M = RECORDED ON MASTER MAGNETIC TAPE.

Figure 4. X's indicate that particular information represented by Item number is needed for document or record shown at left

areas, in such detail that one chart illustrating plant order processing was fourteen feet long and three feet deep.

But the group, in tracing back all the papers and all the work generated through the processing cycles of the whole company, found that every document and every action could be traced back to one of five types of original source data.

1. The customer order—the basis of all company actions—the "beginning of everything" in Carborundum's phrase.

2. Manpower information—reflected in payroll source records.

3. Materials, supplies, and services—evidenced in purchase documents.

4. Physical assets—shown by capital appropriations and related records.

5. Master information records—encompassed in customer files, product catalogs, price lists, discount tables, etc.—the fixed or static data used by the company in its work.

The Carborundum conception is illustrated in Figure 1. The center box represents the four major functional classifications of business activity—manufacturing, distribution, administration, research and development. As the customer order comes into the company and proceeds through the company, it generates the expenditure of cash for manpower, materials, supplies and services, and physical assets. These varied inputs and the documents which record them, when coupled with information drawn from the master information records, produce two types of output—sales, which replenish the cash of the company; and new information for master record entry—new product specifications, new prices, new discounts, etc.

And all the papers and information generated through all the company's operations, all the internal source documents are built, according to Carborundum, on the original external inputs.

If this is true, reasoned the Carborundum group, several basic operating principles stem from it. First, the closer one starts to the basic input documents, the source of information, the simpler it will be to pass along the new data incorporated in these documents through all the necessary company pipelines in the form of machine language. Moreover, in any given area, the actual input information needed to create the necessary output results can

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Personnel

Problems and practices—1959

All indications are that, automation or no automation, the number of office workers needed will continue to rise through the foreseeable future. As business proceeds into the '60s, it will be aided by a greater supply of workers than ever before. But there will be many changes in the basic groups from which clerical workers are drawn—changes which will continue to demand thought, perception, and understanding on the part of those charged with the personnel responsibility.

Six major challenges for personnel administration foreseen in the '60s—

Drop in number of workers in 25-34 age group, morale and initiative of incoming younger workers, increasing competition for executives may present major problems—

by Edith Conner
Associate Editor, *Office Management*

THE '57-58 recession, which shadowed the American business scene for some eight or nine months, has long since disappeared from the headlines. It lingers on in sub-heads, perhaps, but mainly through statistics which show that nationwide unemployment remains stubbornly high.

The recession's effects, though, as far as the office is concerned, are still felt in a number of areas—areas which not only concern the office today, but which seem certain to concern it for some time into the future.

The business downturn reached its worst point last April and, since that time, almost all indices have shown a continuing improvement. Unemployment figures in the nation reached their highest point in June, when large numbers of high school and college graduates entered the labor market—or tried to at least. Many found that

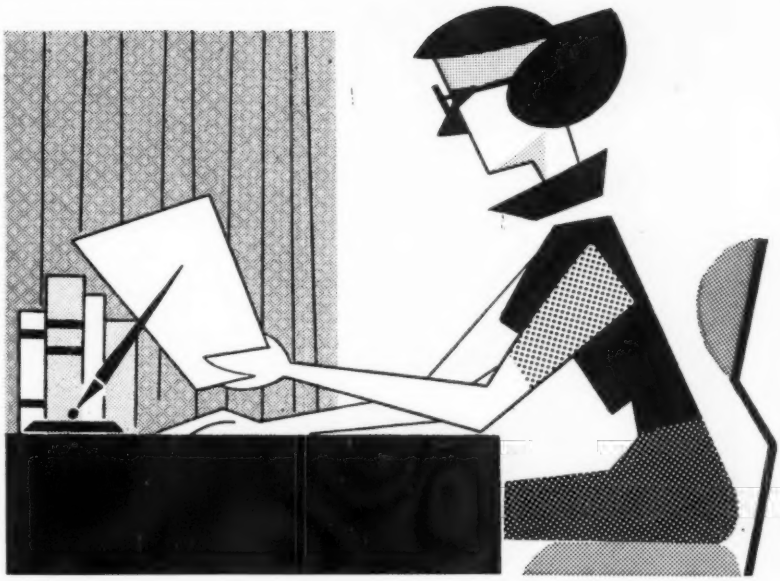
An increasing number of companies, concerned because their executives lack a sufficiently broad educational background, are sending their men to special "businessmen's" liberal arts courses in colleges and universities

jobs were no longer looking for them —and some found that too many of their colleagues were also looking for the jobs they sought.

At that time, the office, while not experiencing the turnover which it had come to accept almost as chronic, was still not experiencing the pinch which was hitting production lines across the country. It was not laying people off, except in rare and isolated instances. Nevertheless, it was shaken by what had happened in the industrial production lines, and it was the scene of definite and notable changes in many companies. Management, by and large, was taking no chances: as part of a general reassessment of all operations designed to preserve and protect profit margins—or in some cases to keep losses as low as possible—it was analyzing very carefully its entire office operation.

In many cases, such analysis brought home to management some very startling facts: that the office had gained so in personnel and functions over the years that its costs represented a very substantial part of company operating expenses; that many of its procedures were antiquated, and all too many were entirely unnecessary; and that its cost control methods were inadequate as compared with those of the factory, in instances where they existed at all. It found much that could be slashed in cost; much that could be eliminated altogether.

Thus, devastating as it was while it lasted, in terms of individual workers furloughed from idle production lines, the '57-58 recession had some beneficial results from the viewpoint of the business picture as a whole. On an overall basis, it brought to an abrupt end the complacency—at times verging on ineptness—that had bled business profits through the boom years. It caused management to recognize that the office was no longer a peripheral area where a few dollars lost here, a few dollars lost there, really would never amount to enough to worry about. It forced management realization that the office in most companies today is a major operation; that mistakes made in the office can have just as serious effects as mistakes made on the production line, and sometimes far more serious ones; that the office represents a major factor in company costs, and should receive the same attention as any other part of the company representing a heavy annual investment.



The coming dearth of men in the 25-34 age group will probably force many offices to let down their bars against promotion of women to executive jobs

Such streamlining of company operations as followed this healthy re-evaluation and reassessment will not be short-lived, according to business leaders. Business in general, finding that it could cut costs substantially without in any way hindering company operations—and in many instances improving them immensely—intends to avoid ever sliding back into the comfortable, but dangerous, attitude that allowed waste and inefficiency to develop in the office in the first place.

New confidence apparent

The success of its belated "streamlining" of office operations and costs has given business a new confidence. Signs of the confidence are apparent in the many companies which report that they have every intention of maintaining last year's self-analysis on a perpetual basis. Cost-cutting programs instituted last year will continue to receive careful attention in most offices, according to company executives; detailed cost control, equipment modernization whenever and wherever needed, and continual efforts to improve procedures will be the order of the day from now on.

So far, a healthy picture. With the worst worries of the recession past, and with the lessons of the recession well learned, business looks forward with confidence—at least as far as its own internal operating routines are concerned—to the future. Conceivable future clerical shortages: well, the "war babies" will hit the labor market within a few years, a tremendous crop of workers. Machines will continue to improve, and this will help to improve office procedures—and the office cost picture. And an expanding economy is agreed to by nearly everyone—an economy in which demand should continue to increase, and most well run companies continue to prosper.

The office, in other words, has every reason, so it would seem, to look toward the future with confidence.

There is only one flaw in this picture—but it may prove to be a very serious one. The office is still staffed by people and, however much it may be automated, there will never be the relative disproportion between the importance of people and machines in the office that there is in the modern factory. In factories, machines do the work, and men run or tend the machines. In such an organized work flow, a simple, well understood, and fairly well disciplined work structure can not only be established; it is the only possible way of accomplishing the work. In the office, on the other hand, machines help people to accomplish the work. The prime mover is the human being. An office worker is not a "hand"—ever.

In essence, the relative quality and ability of personnel will always be a much more important factor in an office than it will on an assembly line.

And so the quality of the personnel it will be employing in the years ahead, the sources of its supervisors, the changes that may occur in the age groups which staff it—all these factors are of vital concern to the office, and may very well affect sharply its whole way of operation, its methods of selection for promotion and its application of discipline.

Basically, the six main personnel problems the office might begin thinking about in terms of the future are these:

1. The potential of the "war babies" —today's teenagers—as office workers.

2. The certainty that by 1965 the 25-34 age group, for both men and women, will be considerably smaller for the nation as a whole than it was in 1955. This will mean greater dependence by the office on personnel drawn from those over 35 and those under 25, with a relative minimum of the intermediate group.

3. The increasing competition in the search for potential executive talent—and the increasing doubts about the best sources for that talent.

4. The fact that women workers, the largest part of the average office's strength, will be drawn increasingly from married women in the post-35 age group, and less and less from girls just out of high school or college.

5. The fact that the search for executive talent; and the coming dearth of men in the 25-34 age group, will probably force more and more offices to let down their bars against promoting women to executive positions.

6. The fact that unions, conscious of the fact that the proportion of production workers in the work force is dropping while the proportion of service and clerical workers rises, are beginning to look on the office as a stronghold that must be taken.

All of these possible "problems" are based on the assumption that the office is going to continue to need an expanding work force in the future. And that, at this stage of the game, seems as safe an assumption as can be made about anything in our economy.

So, let's review each of our six areas and see what possibilities are inherent in each of them:

1. The "war babies." The present teenage generation, the question of juvenile delinquency entirely aside, seems to differ in some startling and rather significant ways from its parallel age groups in the past. Adolescence has always been a period of rebellion against adult authority — rebellion either open and defiant, or covert. It has been, that is, until now. Now it is not a rebellion, so much as a complete indifference, an absolute failure to recognize that there is any authority except the adolescent himself and the group of which he is a part.

Or so the latest sociological studies of this new entity on the American scene certainly report. It is recognized that each adult generation has worried about the "younger generation," that there has always been conflict between the two. The trouble today is not that there is conflict, but rather that there is too little. The teenager simply does not recognize adult authority; there is nothing to rebel against; he goes his own way within his own group, and that is that.

Cynicism is widespread

A recent series in the *New Yorker* magazine, November 22 and 29 issues, describing some of the sharp distinctions that differentiate today's teenager from his predecessors, makes these points:

Today's average teenager is a complete conformist, no matter how strange his behavior may seem to adults. He conforms to the pattern set by his group—his own age group and his own particular social group within that age bracket. He does not pattern himself on adults. But, within his own group, his greatest pride is to be just like everybody else—in clothes, habits, mannerisms, speech, and interests. That fine old American institution, the adolescent set to challenge all and sundry in defense of his own individual ideas, seems to be increasingly rare.

His conformism to the standards of his own group, conservative though it may be in its nature as opposed to the rebelliousness of the past, is not of a nature to please either American conservatives or liberals very much. In response to a recent survey of high school students conducted by the National Better Business Bureau, these somewhat startling figures were unearthed:

Only 39 per cent of the students interviewed believed that keeping the profit incentive alive is essential to the survival of the present American system.

79 per cent said that most of the gains achieved from new machinery go to the owners.

55 per cent believed that the basic principle of Marxism: "From each according to his ability; to each according to his need" is a valid basis for an economic system.

82 per cent are sure the United States does not have real competition in business.

60 per cent believe it foolish for a worker to produce all he can.

Cynicism would seem to be the order of the day—among a group noted for its conformity rather than its attachment to individual values. It is a group, moreover, which, privileged as no other non-adult group has ever been in America or, perhaps, for that matter in any other Western country, has shown a strong tendency to regard adult interference in its affairs or even mild direction as unwarranted, sometimes a nuisance, and in no case to be taken too seriously.

And this is the group from which our next great wave of younger workers will be coming.

2. The absolute drop in the number of workers in the 25-34 age group by 1965. This problem relates directly to the problem of what kind of workers the war babies will make and what kind of supervisory problems they will create. At the very moment when office workers—at least male office workers—in the under-25 age group will be increasingly available, the workers in the next age group will be scarce. In terms of an expanding national clerical work force, the basic new workers, who may very well present the greatest supervisory problems the office has faced yet, will arrive on the scene just as the natural age group from which their basic clerical supervisors would ordinarily be drawn is growing relatively smaller. If the new workers drawn from the postwar generation do present some of the problems, both in terms of resistance to authority and lack of initiative that it seems possible they will, the office will have two main solutions open to it: to increase the ratio of supervisors to employees, or to institute a much more

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Is personnel administration falling behind in a rapidly changing world?

Personnel administration is part an art and part a science, but too often it's handled as though it were all art—and an occult one at that—

by Cecil E. Goode

A FEW YEARS ago a personnel executive characterized the status of his profession as "consisting of two signs—'Help Wanted' and 'No Jobs Today'—with a dash of 'Safety First' and garnished with an annual employees' picnic."

Today, the business of personnel or industrial relations might be described as finding out what unions will settle for as against what they say they want, finding out what other companies are doing, and looking for solid citizens (*organization men,* junior grade) as workers.

What we mean when we say we are interested in hiring solid citizens was described recently to the author by a personnel executive in these terms: "We want solid citizens. The work in our company is very simple and I suspect this is true in most companies. We have found, to our surprise, that a person can learn the average job with very little instruction. So, you can see a lot of skill is not necessary. The main thing we need is the right attitude. We want people who don't do a lot of thinking and stir up a lot of trouble. We want the kind who come to work, do a good day's work, go home, and lead a solid existence at home and in the community."

Personnel research needed

The age in which we live is forcing some introspection on the part of personnel people. Will we have to change our way of thinking, how we do our job, even ourselves? That we are now living and working in the midst of a scientific age is obvious. The amount spent for research and development in this country has increased eight times since 1950—from one billion dollars in 1950 to eight billion dollars in 1958, and it is estimated to be nine billion dollars in 1959. Billions are being spent in developing new products and processes, in converting to mechanization and automation and, to a lesser extent, in pure science. Every enterprise that expects to keep up has organized research laboratories and employs hundreds of scientists and engineers.

Even though we are devoting a rapidly increasing share of our national income to scientific research and development, a very small portion is being devoted to the social sciences. Not over one per cent of the total involves research in the social sciences, and, of course, only a small part of this is of interest to those concerned with the organization, supervision and management of people in all types of working organizations.

The technological race with Russia has stimulated the training of more scientists and engineers to staff our burgeoning scientific and technical efforts. Already, social scientists are giving special attention to the peculiar problems of managing and directing technical and professional staffs. This points to a deficiency in our technological progress: a lack of understanding of human problems in modern organizations and the lag of personnel

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practices behind advances in the physical sciences and engineering.

Peter Drucker, in his recent book, *America's Next 20 Years,* states this thesis:

> "During the period ahead, in any event, the greatest need for innovation seems more likely to lie in the social than in the technological area . . . the need is for effective innovation in the management of workers and in the organization of work; despite the progress in this area, it may well be the most backward sphere, and the one with the greatest potential for increased productivity."

Recently, when the author was talking to a group of supervisors and personnel workers, a member of the group asked, "What do you expect to find out by studying people in organizations. People are the same as they have always been. The area of human relations is not the same as discovering how to split the atom or to develop a vaccine to prevent polio. You can't invent new ways to handle people."

In one sense this statement is right. We probably cannot invent new ways to handle or manipulate people but we can understand better what the effective human capabilities, motives, ambitions and satisfactions are. The new field of human engineering is discovering some simple and hitherto little appreciated limitations of human powers, as for example, how many dials on a panel human beings can control and what the optimum positioning of buttons on a control panel should be.

The one statement that expresses more cogently than any other what science really is—in the human as well as the physical realm—is this one by the late industrial scientist Charles F. Kettering: "To me science is merely finding out how nature does things. It's just as simple as that." Too many personnel workers have lost their curiosity. They have grown comfortable in comfortable offices, have reached comfortable salaries, and have self-induced feelings of satisfaction that they know all they need to know about managing people.

No personnel man can relax in the assurance that he has solved all the problems of his company or organization. We may solve one set of problems and, even before we have finished, a brand new set of problems arises even more difficult than the last. Take these for example:

What about the complaints of *Organization Man?* Have we lulled employees into comfortable complacency and sterile conformity? If we have, will the productive machine eventually suffer?

With the increasing number of scientists, engineers and technicians being trained and employed, can we use standard personnel and management procedures—the same as we use for other workers? How can we pick creative people and how can we encourage them to remain creative after they have been employed?

How about the problems of changeover to mechanization or automation? How soon will a given enterprise need to, or be in a position to, mechanize or automate? What preparations are necessary in advance? Will present workers experienced in traditional methods fit the new process and will they be satisfied?

How can we select and train executives successfully? Are our present efforts much better than no system at all? Have we tried to find out what background of training and experience provides the best managers?

What about the question of shorter hours against a continued labor shortage? To what extent should an employing organization attempt to provide leisure time activities, or should workers be left on their own?

What about the question of more security? What are the prospects of regularizing employment? What about the guaranteed annual wage and about retirement systems? Should the retirement age be raised or lowered? Does utmost security make better workers?

Personnel executives, too often relaxed in the assurance they have solved all the problems of their company, could learn a great deal from the scientists who, admitting they don't have all the answers keep on trying to find them—

On the question whether personnel management is an art or a science, we usually conclude it is both. Nevertheless, it is operated more as an art than a science, and an occult art at that. While making a study of the present use of social science to solve personnel and management problems, the author assembled a group of 21 ranking personnel executives within a metropolitan area* and asked them to fill out three rating sheets as follows: (1) a list of personnel research findings that they have used in their work within the last seven years; (2) a list of ongoing personnel research or research that has been conducted within the last seven years that stands out in their minds as being most significant; and (3) a list of personnel research projects that they think should be conducted but, to their knowledge, are not now being conducted.

Responses showed lack of knowledge

Analysis of the responses indicated that the personnel executives' knowledge of outstanding research was superficial as was also their interest in research that should be conducted. For example, only 29 per cent of the listed researches appeared really to be research. Most of them were merely management studies, information pieces, or management programs.

Most people when they are young, including personnel executives, are inquisitive and accept nothing as gospel truth. But when they get out of school and go to work they become experts and can't admit that they don't have all the answers. This is not true, however, of people trained in the sciences. No physicist working on atomic energy considers that he has all the answers. No astronautic scientist will admit that he has even a few of the answers. No physician or engineer will claim to have all the answers in his field. Each of these has a healthy curiosity about the many unknowns of his profession. He remains a student; he has an ingrained scientific attitude, which is to search for all unknown facts on a problem, draw up hypotheses or theories, and then test them until the truth is known.

What we need among personnel administrators and their staffs is more humble regard for the unknown, more imaginative search for answers to problems, more willingness and courage to test out ideas, and less blind faith in methods and procedures that really have nothing more to support them than long use.

An example of traditional personnel thinking is the hoary cliche that 'round pegs should be placed in round holes and square pegs in square holes." Robert McBane, while a student at the University of North Carolina, questioned this time-honored principle:

> "But this apt and innocent phrase may have an unfortunate influence on our thinking about placement and use of personnel. It is strongly suggestive. It tends to persuade us that all our pegs are neatly and conveniently pre-shaped and that all we need to do is determine the shape by scientific tests, then, with an admirable display of departmental dexterity, slip the peg into the proper hole. Presto! The peg's adjustment and comfort are guaranteed, and management can rest assured that maximum use is being made of the peg. Just to loosen up our thinking on the matter, let us consider this pertinent comment by some unknown sage: 'Putting a square peg in a square hole is the one best way of denying the peg any room for movement or expansion!' "

If the case has been made for doing something about the personnel management business, what can personnel managers and their general management bosses do to get in step with the times? Here are some suggestions:

1. More attempts to become social engineers. The engineer takes the knowledge and findings of science and applies them to the practical problems of building a bridge, an automobile or an earth satellite. The social engineer would take the insights, the accumulated knowledge and the new findings of the social sciences and apply them to the problems of organizing, selecting, assigning, motivating and rewarding people in working organizations.

2. More initial training in the social sciences and humanities—psychology, economics, sociology, anthropology, history, philosophy and the scientific method. Less emphasis on "bread and butter" courses in business administration, public administration, and personnel administration. The "gimmicks" can always be learned on the job.

3. More adult learning from new experiences, new literature and special training programs; more thirst for new knowledge and human insight; less satisfaction with present knowledge, present methods, and the *status quo*.

4. More research staffs in personnel organizations. Research staffs can collaborate with university research institutes and other research organizations. Such staffs do not have to be large; quality should be the goal. Every organization does not need to have a large personnel research staff as the General Electric Company and the American Telephone and Telegraph Company have; but it would help.

5. More sponsoring of personnel studies by university research groups and other research organizations. Scientific research efforts will be productive and of practical application to the extent that working organizations permit themselves to be guinea pigs. You can't learn about organizational conditions and problems by studying college sophomores.

In summary, the personnel profession has not kept pace with progress in the scientific and technical sphere. Personnel executives have been too satisfied with present points of view and ways of doing things. The key to closing this gap between the technological realm and the human realm is to change the attitude of personnel people. They need to embrace some of the scientific curiosity of their scientific colleagues. They need to remember that their education is never complete.

*See *Personnel Research Frontiers*, by Cecil E. Goode, Public Personnel Association, Chicago, 1958.

Manpower Council: Women past 35 to form main strength of future clerical force

Drop in marriage age, lengthening life span are causes of major change in female work force: married women who have completed families will form majority of workers—

An *Office Management* Staff Report

TODAY, the average American woman marries at age 20.

She has her last child at age 26.

When she has reached the age of 32, her youngest child is in school, and by the time she is 35 the last youngster is pretty well occupied with his own school and recreational opportunities.

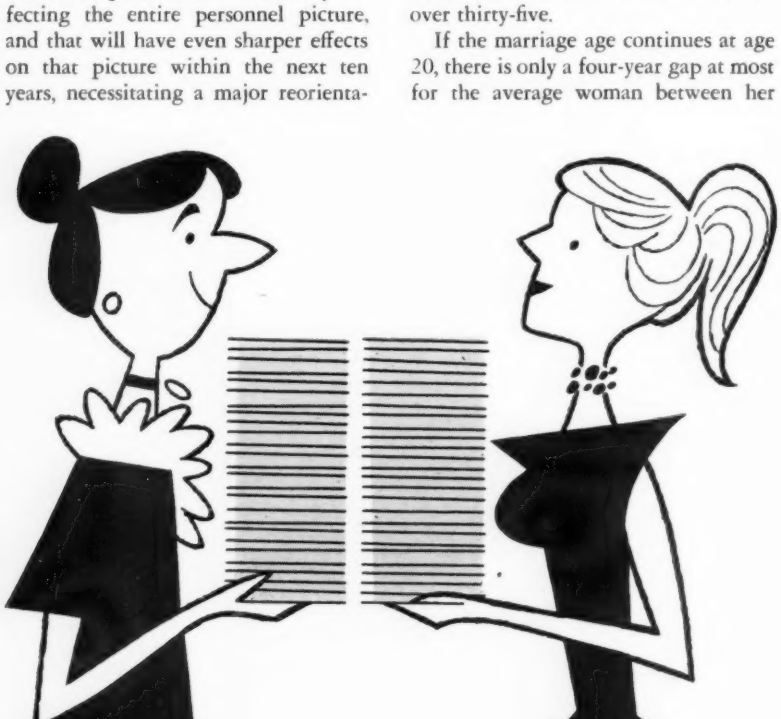
What significance do these domestic facts have for the office? Simply this: they signal an immense shift in American social patterns that is already affecting the entire personnel picture, and that will have even sharper effects on that picture within the next ten years, necessitating a major reorientation of personnel practices and theories on the part of American business.

For the rapidly emerging fact is that the lower age at which women are marrying today and the consequently lower age at which their childbearing and primary child raising activities come to an end, means that the office, which employs far more women than men, will have to depend more and more on older women workers in the future. "Older" in this context means women over thirty-five.

If the marriage age continues at age 20, there is only a four-year gap at most for the average woman between her graduation from high school, and the time of her office farewell party a few months before she has her first baby. For fifteen years then, on an average, she will be out of the full-time work force. At the end of that fifteen-year period, the chances are at least even that she will wish to re-enter the work force, and if she does, at age 35 or 36, then she will probably work for the next twenty- to thirty-year period of her life.

Thus, the change in the marriage age, and the shift downward in the childbearing years definitely mean that employers relying on women workers to a large degree are going to have to depend increasingly on mature women seeking to re-enter the work force.

These facts—and some of the implications that can be drawn from them—are the subject of an extremely significant National Manpower Council report published in 1958. The report, "Work in the Lives of Married Women," is based on an earlier conference on Womanpower sponsored by the Council.

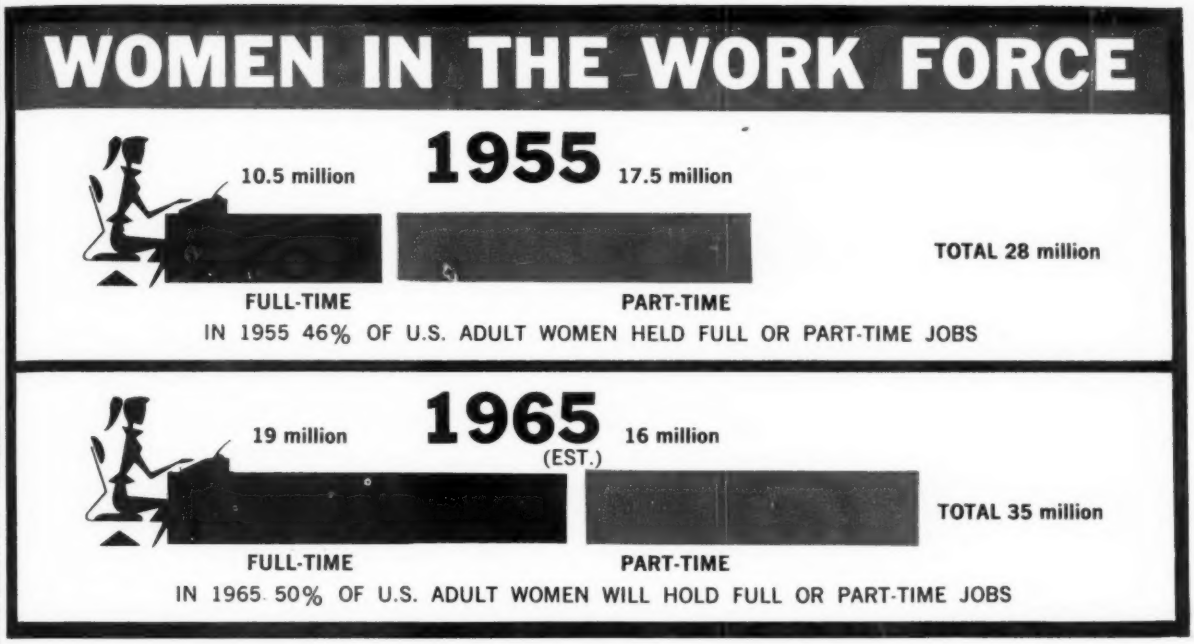


Tests have shown no appreciable difference between older and younger women in terms of work quality or output

Women dominate office work force

Women, in spite of the fact that many prejudices still operate to handicap them in business and industry, make up a tremendous portion of the total work force today, and will make up an even larger part in the future. In the clerical occupations, of course, they already constitute a clear majority of the workers. According to the Statistical Abstract of the United States, the ratio of women workers to men workers in the clerical occupation was well over 2 to 1 in 1958, and a very substantial part of the professional and technical working groups was also composed of women.

So the findings of the National Manpower Council regarding women workers, although important to every segment of business and industry, are of vital importance to the office, covering as they do the greatest part of its work force.



And the figures revealed at the conference show that many of the accepted beliefs that have dominated employers' attitudes toward women workers for many years are without any foundation at all. Labor Department statistics of 1955 quoted by Secretary of Labor Mitchell at the Womanpower conference showed that a total of 28 million women worked during that year, but that only 10.5 million of this group worked at full-time jobs for the full fifty-two weeks. On the basis of Labor Department figures, Mitchell predicts that by 1965 there will be 35 million women available for work—and that by that date 19 million will be available for work the year round.

But the largest part of the group that will be available on a full-time basis will be married women who have entered their last child in school, and are returning to the labor market after a fifteen-year interval for bearing and raising a family.

"Our statistics indicate," Mitchell reports, "that the steadiest workers' pool of all among women is the 45 to 54 year old age group. Those in this age group work — nearly half of them — at full time jobs throughout the year. The employer who wishes to fill full-time jobs with women workers will necessarily have to look for those who are over 35 years of age. This is a fact today, and will be a fact ten years from today, as far as we in the Labor Department can see. The wise employer therefore will think about devising a staffing pattern which permits some jobs to be filled by full-time office personnel, and others to be filled by two or more workers, each working part of the year or each working part time."

For only such a split pattern, according to the Labor Department, will allow the fullest possible utilization of women in the work force, and women today remain the nation's last great labor reserve not fully utilized.

Vocational guidance criticized

But the implications of the country's social changing patterns have a far greater significance to American business than a simple realignment of work patterns in the office to achieve greater utilization of women workers, according to the report.

Traditionally, elementary and high school education has prepared both boys and girls with a general background of knowledge geared basically to further education in colleges and universities, but presumably adequate in itself for youngsters not equipped or financially able to go on to college. Recently, though, more and more vocational courses have appeared in the high school curriculum, as well as various fringe courses connected only tenuously with the traditional liberal arts curriculum.

The vocational courses and counseling, as far as girls are concerned, have been constructed on the theory that high school graduates would enter the work force immediately after leaving school, and would remain in the work force until marriage, at which point most would permanently leave employment. Presumably, the work interval envisioned under this system would be fairly long.

But the actual facts, as the report points out, are entirely different. The shortest and relatively least important work period in the average woman's life today is the span between high school or college graduation and marriage. It is so short in most instances that it really has no significance at all. The average woman's real period of employment begins after age 35, when she returns to the work force.

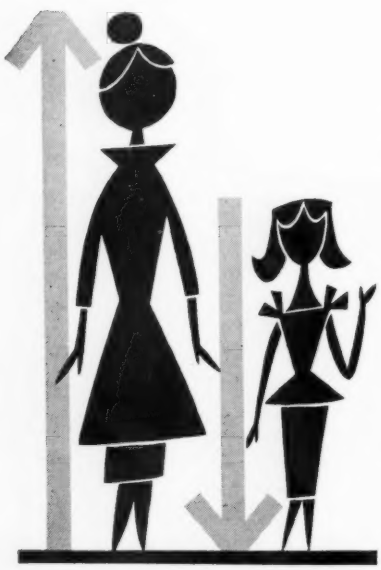
Thus, according to some conference participants, not only is vocational guidance in the high schools today often misdirected, since it is based on assumptions about female employment that simply are not valid, there is also reason to suspect that vocational courses for high schools are relatively valueless to girls, or at least not nearly as valuable as basic liberal arts courses. The latter, this view's proponents argue, would give girls a broader foundation on which to build specific vocational training when they do seriously begin working after the early marriage period has ended.

Furthermore, the conference reports, vocational guidance in high schools today not only lacks reality in terms of woman's actual years of working life; it loses impact because high school girls themselves, anticipating marriage within a few years of graduation, view

their working lives as a temporary hiatus between school and wedding, and so do not take vocational counseling too seriously.

"Girls themselves are looking no further into the future than their grandmothers did," reports Esther Lloyd-Jones, Head of Guidance, Teachers College, Columbia University. "One of my doctoral students asked girls of 18 and 19 in colleges all over the country to tell her of their expectations for their lives. She found that all of these girls vividly anticipated marrying immediately upon finishing college—or before—and having several children. When asked what their lives might be like at 40 and 50 and 60, they were utterly foggy and very vague. Girls and young women have not yet realized, any more than those who educate them, that potentially meaningful, useful lives for them will go on long past the immediate period during which they will marry and have children."

For, while women are completing their families at an earlier age today than was true a generation or so ago, it is also true that they are living much longer. The average life expectancy of women in this country today is 75. Thus, there is a span of approximately forty years between the end of the average woman's heaviest home responsibilities, and her death—by far the largest single age span of her life, if the period before marriage and the childbearing years are considered as separate periods.



The ratio of older women workers to younger workers is steadily rising

The fact that the points stressed at the conference are not simply predictions of some future state of affairs but actually describe things as they exist today is emphasized by the growth in relative strength of different age groups in the work force during the years since the end of World War II.

The number of women in the labor force who are 35 or older rose 50 per cent, from about 8.5 million in 1947 to almost 13 million in 1956, according to a 1957 Census Bureau report. "This rate of growth," the bureau's 1957 report continues, "has not even been approached by any other population group. Younger women in the work force rose by only 5 per cent during the same period, men by 10 per cent. Viewed in a somewhat different way, women past 35 represented less than a third of the population of working age but accounted for half of the increase in the labor force over the past ten years."

Few counseling facilities available

Thus, it is already true that the greatest number of women in the work force on a full-time basis are in the 35 and over age group, but most employment procedures, counseling services, and training programs are still built on the assumption that young women are the largest group in the work force.

"We know that women's behavior, as they enter the labor market, is haphazard, for the most part opportunistic, that it involves little individual planning, and that it finds almost no channelling either from precedent or from counseling agencies," Esther Lloyd-Jones states in the conference report. "Mature women are going back into the labor market in spite of social resistance and in spite of a considerable amount of verbally expressed opposition to its happening."

Such opposition ranges all the way from traditional antagonisms toward married women working outside the home—a prejudice which still claims a surprising number of adherents—to employer resistance to job seekers in their late thirties and early forties.

Much of the public's resistance to married women in the work force is based on a belief that they take available jobs away from men or from single women, or that their children or home may suffer from their work activities. Actually, the conference figures show that if all the married women in the work force today were to withdraw from the market "the economy would collapse and we would not be able to perform the essential services needed." In terms of home life suffering through women's outside employment, the relative size of the age groups in the market indicates that comparatively few women hold full time jobs while their children are young. And, in reply to those who maintain that children, even after they are well launched into school, will suffer from their mothers holding an outside job, conference speakers pointed out that a California test study showed juvenile delinquency rates in the middle income groups were slightly higher in families where the mother did *not* hold outside employment than they were for families where the mother as well as the father held down a job. In the lowest income groups, studies have shown there is no difference in delinquency rates among the children of women who do not hold outside jobs, and children of women who have *regular* outside employment. There is a significantly higher delinquency rate in this income category, though, for children whose mothers have *sporadic* outside employment. Further analysis of the figures, and investigation of the circumstances indicated that the best clue to the discrepancy seemed to stem from the character of the mothers themselves. The sporadically employed group, in the words of the conference report, "tended to be women who had a history of delinquency themselves; also they tended to be married to men who were emotionally disturbed, and who had poor work habits."

In other words, the character of the parents, the circumstances of the home, and the characteristics inherited by the children from their parents seem to be much more reliable indications of the cause of the delinquency rate in this group than the fact that the mothers held outside jobs.

Employers' reasons for reluctance to hire women over thirty-five as summed up by Mitchell:

"Many managements have had an employment policy completely disassociated from union rules by which they would not hire anybody over 40," he reports. "Their reasons were varied; pension considerations, or the expectation of absenteeism problems, or welfare and health difficulties. In this area, management could change its policy with less difficulty than it expects."

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Production line workers are becoming a minority in the work force—and the unions are well aware of this fact

Changing ratio of clerical and production workers spurs unions' interest in office

AFL-CIO economists warn their groups that labor unions must organize white collar workers if they are to maintain their membership strength in the future—

An *Office Management* Staff Report

TIME: THE 1960s. Place: the office. Action: there is none. It is morning of a normal Tuesday. The city is busy. The office next door is bustling. But here, only hooded typewriters, dim lights, work in suspension. Where are the bookkeepers, secretaries, file clerks?

Where are they? Downstairs picketing.

American office managers may have to learn that scenes like this are at least possible in the years ahead. Labor, long noted for its problem plays about life on the assembly line, is debating a whole new cycle showing the effects of office automation.

Office organizers, until now the patient bit players on labor's stage (and until now not especially box-office with clerical workers), suddenly find themselves auditioning for starring roles. AFL-CIO casting directors are listening with greater attention to union economists who advise them to play to the office audience. Automation has been turning office workers into veritable production workers anyway, the reasoning goes, while at the same time it decimates the ranks of older, industrial unions.

No less an impresario than Walter Reuther took care, recently, to spotlight the separate negotiations he conducted for UAW clerical workers at Chrysler. Delays in settling this contract kept Chrysler idled longer than its competitors in this latest round of auto-worker bargaining.

All this is not to suggest that simply by the decree of Reuther or George Meany or James Hoffa, office unions will suddenly materialize.

From the viewpoint of Big Labor, the need for more office unions is real enough. But before office unions can grow, organizers must win battles on at least three fronts.

The first obstacle, of course, is labor's traditional antagonist, management. It's a big obstacle. Management prides itself on its enlightened approach now.

Indeed, it freely provides employee benefits unheard of even ten years ago. It abjures the practices which blackened its name with labor and general public in decades past—short-sighted practices that nurtured the early strength of the unions in many industries, and, indeed, probably were the greatest single influence contributing to the rise of the unions.

Labor must overcome a second formidable antagonist—itself. This is not merely a matter of cleaning out the racketeers and petty tyrants in its ranks. Actually it involves profound rethinking of the role of unions in a changing society. The sinewy union boss — spokesman for workers whose jobs were mainly manual — is destined to have his influence checked by more soft-spoken, gentlemanly leaders, prototypes of professional and technical workers whose "labor" is largely mental.

Thirdly, labor must overcome the ingrained reticence of office workers themselves. It has had a tough time, so far, convincing white collar people that they really "need" a union. "Our biggest organizing problem here," a union official said last month, "is people's 'imagined potential.' Every $60-a-week teller thinks he's going to be president of the bank."

Management's "enlightenment" (or, as labor likes to say, "paternalism") in providing better working conditions, has only increased the white collar bias against unions. In addition, organizers cite these reasons why office people balk at unionism:

Women. Organizers call this the "until problem." Women like to think they're only working until. Until they get married. Until they have a baby. Until they get the car paid off, or the house paid off, or until they get Johnny through college. Consequently, they're not too militant about schemes to protect their job rights or seniority, when they feel their jobs are only temporary anyway. And remember that women represent nearly two-thirds of all office workers.

Youth. The October, 1958, issue of *Labor's Economic Review,* published by AFL-CIO, sums up the problem, from the unions' viewpoint, this way:

"With each year there are fewer individuals in the labor force who retain any memory of the hardships of the 1930s when so many workers first recognized the need for union organization. The young worker starting out on a new job takes for granted wage standards and benefits which required many years of union efforts to achieve."

Automation: everybody's a supervisor

Taft-Hartley. By the actual wording of its clauses, but more by Labor Board interpretation, the Taft-Hartley Law has hampered the unionizing of office workers. Section 9(b) (1) says professional employees cannot be fitted into industrial bargaining units unless they vote separately that they want to be. Section 2(1) says supervisors can't be in a bargaining unit and, to quote a labor lawyer, "one side-effect of automation is to make everybody a supervisor." As the Labor Board reads these provisions, they apply to *technical* employees and *office clerical* workers as well. Both groups, the board has ruled, are entitled to separate elections before becoming parts of any industrial unions.

Why, then, with all these obstacles, should labor be so intent on organizing offices? Even considering the general missionary motives of true believers in the labor movement, why now turn attention to the white collar worker? Why not remain on familiar ground and spread the gospel to the still-unorganized blue collar worker?

In simplest terms, unions have no other choice. And why so? For that same familiar reason, automation and major technological change.

Those five key words, in fact, formed the title of a momentous conference held April 22, 1958, under auspices of AFL-CIO's Industrial Union Department.

Conferees heard Warren Woods, general counsel of United Papermakers & Paperworkers, enumerate these effects of automation:

"The first fact is that for the first time in our history the white collar worker exceeds in number the blue collar worker.

"The second fact is that the rate of increase in the composition of the work force of the white collar worker is much greater than the rate of increase of the manufacturing or blue collar worker.

"And the third fact . . . is that within the manufacturing sector alone non-production workers are increasing at a rate fifteen times as great as that of the production workers in manufacturing."

Otto Pragan, research director of the International Chemical Workers Union, backed up those generalizations with statistics from his own industry.

"In 1947," he said, "the number of production workers (in the chemical industry) was about 525,000. The average for 1957 was 538,000, an increase of 13,000, or five percent.

"The number of non-production workers in 1947 was 169,000, and the number of non-production workers in 1957 was 296,000, an increase of 127,000 or 75 per cent. While in 1947 the number of non-production workers amounted to 24.5 percent of the total labor force, the average in 1957 was 35.5 percent, and in March of this year [1958] it was 36.8 percent.

"This means, while in 1947 there were three production workers for each white collar worker, in 1957 there were less than two production workers for each white collar worker. In 1968 —and assuming the same ratio of growth as for the period 1947 to 1957 —this ratio would come to one to one. And by 1978 there will be one production worker to two non-production workers."

The implication is plain. Unions must look to the office worker if for no other reason than membership. Automation will continue to erode union strength on the production side. But if organized labor is flexible enough and skillful enough, it can ride the automation wave and sweep along with it into the office.

The need to "change or decline" is sufficiently clear to many labor leaders. Change, nonetheless, is difficult. To some old timers — the gruff union bosses of steaming factories and mills —change may prove impossible. The suggestion that unions of the future "will have almost a professional flavor about them" means a new breed of leaders in power — a disquieting thought, surely, to those in power now. It means a greater voice for unionists familiar with white collar problems— that, or running the risk of mishandling the whole office labor movement.

Actually, the importance of the office is not something that is just now dawning on labor leaders. But up until now, no decisive action has come from

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NEW CONCEPTS IN PRACTICAL OFFICE AUTOMATION

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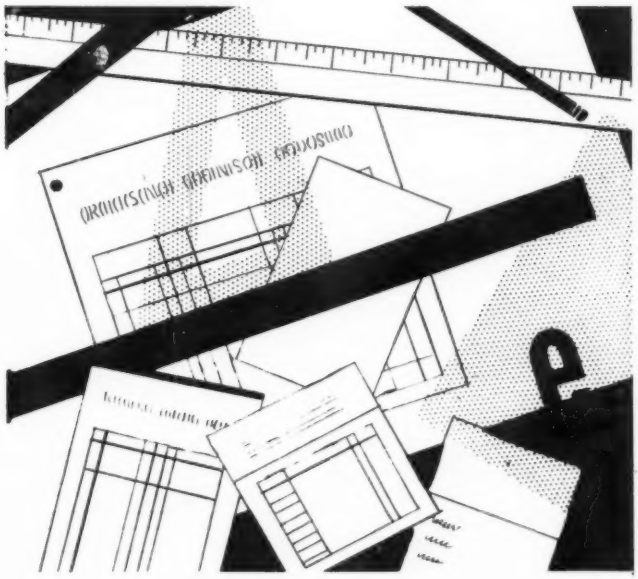
SYSTEMS
DESIGN



The fundamental pattern

The all-embracing framework within which all the routines of an office are encompassed is the system by which that office accomplishes its work. And as the work of the office grows yearly more complex, the importance of good systems planning becomes more apparent. Morale, efficiency, economy—all are dependent on the care, the intelligence, and the knowledge embodied in the company's methods of accomplishing its work.

Profit-Cost Control—a formula to give every management level new incentives

By evaluating each department's output — setting a price on each of its products—and comparing it with the department's costs, a company can improve its profit margin—

by Ralph Fairbanks and Jerome Hoffman

THE MAIN goal of systems study and design—whether it be in office, factory, or in any other type of human organization—is to increase efficiency and reduce the amount of capital, labor and material needed to produce desired end results of a given quality. In office or factory, the sum of capital, labor, and materials can be expressed as costs. The goal of systems design and improvement then can be simply expressed, in any business context, as finding ways of producing more of the desired end products at lowered costs.

The need for protecting the profit margin against high overall costs is accentuated during a period in which company growth is not rapid, or sales, perhaps, even decline.

Top management, whose performance is measured by the company profit and loss statement, is always directly concerned with the effect of any major decisions on profit margins. This concern is reproduced down from top management through all levels of the company, but like any reproduction it loses clarity as the original profit motivation is copied many times. As a result, the middle and lower echelons of management and supervision receive only a blurred copy of the motivation which moves the top executives. The lower level picture of the company is often a distorted image; personnel at these levels often have little realization of how their efforts result in profit or loss for the company.

Top management has long recognized the need for motivation and identification with company objectives among lower management levels. Various types of plans have been introduced to meet this need. These plans have affected the three main functional areas of a company:

1) Sales,
2) Production,
3) Administration

in different ways.

The profit motivation factor has been most successful in the sales area. The traditional concepts of compensating salesmen on a commission basis, and sales management on a volume of business basis, have provided the necessary incentives. Adjusting commission rates and allocating sales quotas have enabled top management to direct selling efforts into the most profitable fields. They have also given top management a measuring tool for measuring individual performance as well as giving the individual an objective yardstick with which to measure himself.

The use of work standards, standard costs, and production and quality incentives has provided the companies which use these management tools with devices for measuring individual, group and managerial performance. When the individual, group, and the manager are motivated through compensation for above-standard production, in a sense the profit motive has been transferred to them.

It is in this area (and we might in many cases substitute the word "overhead" for administration) that we have few traditional concepts upon which to rely, and only a small number of successful examples of profit motivation for the personnel involved. Yet very often this area constitutes a large part of any company's expense, since within the concept of administration we would include all personnel, facilities and items which are not directly involved in the selling and productive functions. For example, timekeeping in a manufacturing department should be considered an administrative rather than a productive function.

Reward is major incentive

Research and engineering, clerical help in the sales office — it is these administrative people at the management, supervisory, and working levels who have the least conscious motivation to contribute to the profits of the company, and who are farthest removed from the measured functions of sales and production. Since their own work is normally not directly measured, a mental gap exists which is not often bridged. This gap results from a lack of understanding of how the efforts of each individual and manager contribute to company profit and loss as a whole, and a lack of objective measurement of group and individual work performance, and the expense involved.

Since the factory in many cases has been largely automated, and market analysis techniques as well as compensation plans have been developed for the sales function, it is the area of administrative cost and its effect on profit margins that offers the next great area of savings for any business. It is this relatively uncharted area for potential cost reduction and increased profits which we wish to explore in this article.

First of all we should determine what factors motivate people, and secondly, how we can use these motivational factors so that the primary objective of greater profits is achieved.

People are motivated by two major factors:

a) Reward, and
b) Punishment.

Mr. Fairbanks is president of Fairbanks Associates, Inc., Greenwich, Conn., management consulting firm. Mr. Hoffman, Senior Associate of the firm, worked with Mr. Fairbanks in developing many of the principles expressed in this article.

In any organization where management thinking is in tune with the psychology of America today, it is obvious that rewards are the primary motivating factor, with punishment held in reserve. Even in a period of economic depression, personnel of management and supervisory caliber (if they have been properly selected and trained) will respond more readily to incentives for achievement than they will to fear. The type of person whose chief reason for working effectively is fear of losing his job is not generally the person who will make a good manager. Fear as a driving force is essentially an emotional factor, and as such tends to negate or deform the logical reasoning processes and the objective attitude necessary for good management.

Managers must share savings

The type of manager we want at all levels in our organization, is the man who

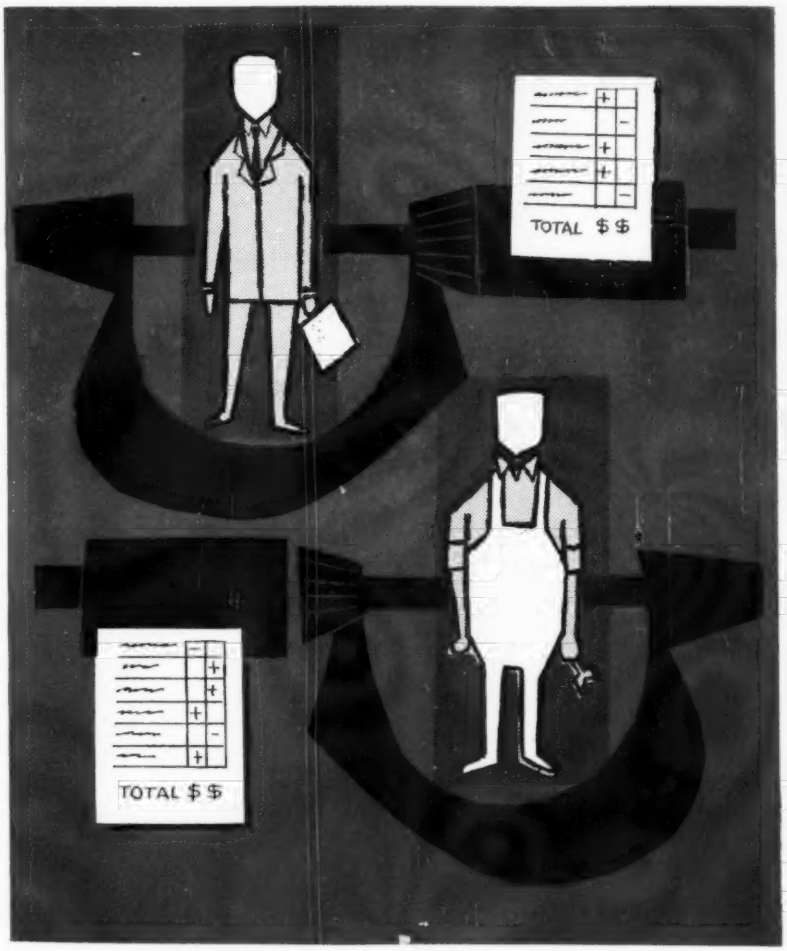
1) takes pride in achievement,
2) can accept objective standards for measurement of his area of responsibility,
3) expects to be rewarded for above-standard performance.

Assuming that we have the right type of managerial personnel at levels below top management (if misfits exist at the top level, steps must be taken to correct their attitudes before any major program can succeed), and that these managers have the "right" attitude, then we must determine how to motivate the individual to perform at his best level. While praise, security and working conditions are important, the good manager will also expect to be rewarded financially for above-standard performance.

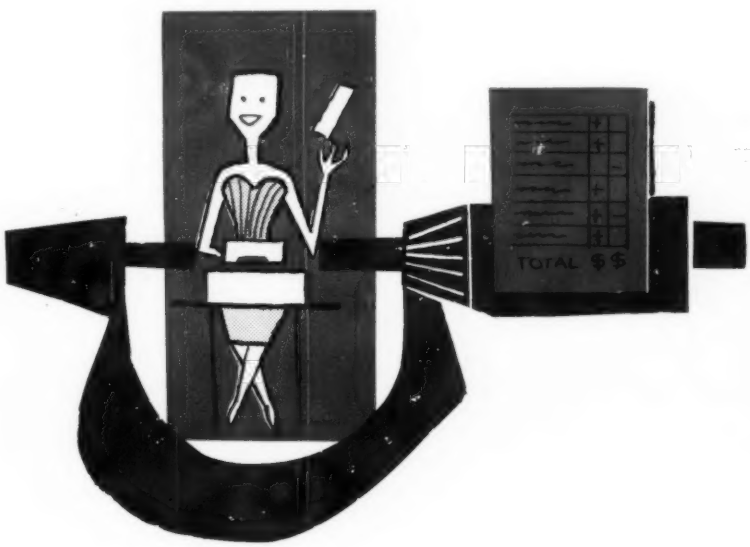
In the beginning of this article we stated the need for extending the profit principle as a motivating factor into all levels of management. If we are to have each manager act as if he owned a business (in the sense that his department, work center, or other operating function of the company, is managed as if it were his own business), then he will expect to be rewarded just as is any other owner of a business by sharing in the profits, if any, which that business produces.

Before the individual manager can view himself as a part owner of his own area of responsibility within the company, it is vital that *top* management accept these principles:

1) that administration is a neces-



Unit cost control is well established in production; it can be achieved . . .



. . . in the administrative areas as well, through proper use of work standards

sary function, contributing toward the profits of the company, rather than an evil, draining the profits of the company; (In most businessmen's minds, *overhead* would be better expressed as *overheadache*);

2) that administration is a productive function of the company, performing services which enable the sales and production areas to function;

3) that unnecessary administrative work should be eliminated, but that the remaining necessary work should be given equal standing with the other operating functions of the company;

4) that administrative personnel should be rewarded on the basis of their effectiveness in the same sense as production management and sales management;

5) that because the nature of administrative costs makes them difficult to measure, it does not follow that they are unmeasurable;

6) that to be effective, measurements established for administrative work should be acceptable to both top management and lower levels of management personnel who are directly responsible for the work performance;

7) that in establishing standards of performance, scientific objective techniques will be utilized, and that lower level management will be measured on those conditions over which they have control, and allowance made for conditions which are not within their control;

8) that the system of accounting for costs and reporting on work achievement versus expected work performance be

a) simple enough so that all levels of management can understand its operations,

b) up-to-date, so that measures can be taken to remedy unprofitable situations immediately, and plans made to prevent recurrences,

c) economically sound, so that the expense of maintaining such a system does not absorb a large proportion of its benefits.

In the remainder of this article we shall discuss a concept and outline a plan which can be used, with modifications, by most companies to increase profit margins. We have called this plan Profit-Cost Control (PCC).

PCC is a broad program initiated and sponsored by top management, and includes in its scope all administrative functions of a company. Its main objective is to motivate management personnel at all levels in order to increase overall company profits. It accomplishes this objective by:

1) providing the type of company atmosphere and incentives which make each individual conscious at all times that he is in business for himself within his own area of responsibility, with the simultaneous realization that he is in a cooperative venture with other management personnel in business for themselves under the direction of top echelon management;

2) providing scientific measurement tools which are as objective in measuring individual executive performance at lower levels, as the profit-and-loss statement is for top company management.

PCC differs from "profit-sharing"

As is the case with top management, whose profit and loss results must be read in the light of business conditions over which they have little or no control, the limits of responsibility must be determined for the middle and lower management levels, so that they will neither be penalized nor favored by conditions over which they have little or no control.

Besides serving as a motivational and measuring tool, a properly designed PCC program enables management

1) to determine in advance the effect on profit margins of alternative courses of action,

2) to identify problem areas as they develop, and to provide current factual data on which to base decisions for corrective action,

3) to forecast with a greater degree of accuracy future requirements to enable the administrative areas to be properly scheduled,

4) to highlight areas in which revisions of methods of work and changes in personnel would prove profitable to the company as a whole and to the individual work center.

Before a company can begin to reap the benefits inherent in a properly planned and executed PCC program, top management must analyze its own objectives and thinking. It must be willing to admit that improvements can be made in the administrative functions of the company. It must be willing to pay for these improvements in terms of sharing cost savings or increased profits with the individuals who are responsible for these gains.

Normal company-wide profit-sharing plans cannot be equated with the PCC concept. The usual formulas for sharing profits on a company-wide basis depend upon two assumptions (either or both of which may be false):

1) that there will be profits to share,

2) that the contribution each individual makes to these profits is accurately measured by previous salary compensation, length of service, job title, or a combination of these factors.

The purpose of PCC is not to distribute previously earned profits on a company-wide basis, nor is it based upon the false premise that profits will be the automatic result of the sum of effective and ineffectual actions of a number of individuals. Neither does it make the automatic assumption that an individual is producing results in direct ratio to the salary he is paid. PCC is based on a measurement of profitable activities of each manager's or supervisor's area, viewing it as a business; selling a service, properly performed, at a price acceptable to the company as a whole (which is buying this service). Under the PCC concept it is possible for some individual manager to be poorly rated even when the company as a whole is showing a good profit margin. It is also possible—under some conditions—for an individual manager to be highly rated even when the company as a whole is showing a loss.

Top management's first job, therefore, is to analyze carefully the prospects for achieving a more profitable overall operation if administration costs (which would include all areas which we normally consider as indirect or overhead expense to the company) could be reduced and/or administrative quality and speed could be improved in order to increase sales and reduce costs of the selling and production functions. When the determination of the result (in terms of dollars) which can be anticipated has been made, the company is in a position to determine if a PCC program is to be initiated to improve the profit margin.

The next step for top level decision is to determine if the "personality" of

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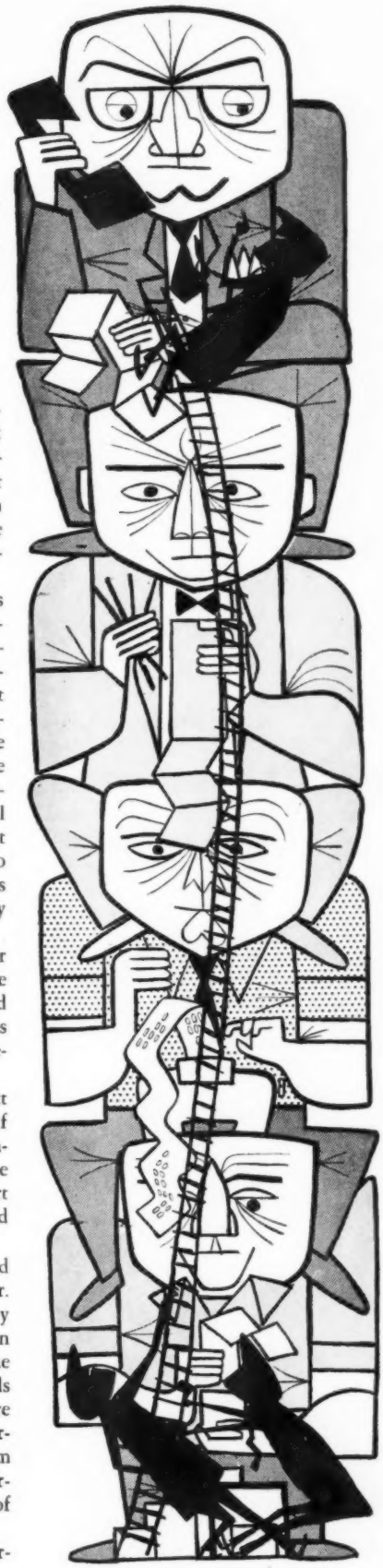
Let's stress information—not pieces of paper

Paper may be the traditional medium for transmitting information within the office but perhaps business is being blinded by a tradition that's outdated and unnecessary—

by Robert Shiff and Alan Negus



"NOTHING happens in the office without a piece of paper. . . ."

Is this true? Or is this frequently quoted line actually a myth, which a moment's analysis will expose?

Actually, nothing could be farther from the truth than the statement as it stands. Decisions, actions, most of the executive work of the office, are based on information, not pieces of paper—and information can come in many forms. Memory, meetings with colleagues and staff, the telephone and other instruments of verbal communication, casual conversation even — without these business would grind to a halt because so much vital information is obtained through these media that has never been recorded in the first place, and never will be.

Anyone who has ever done a systems study knows that he gets most of his information and facts from people, not from pieces of paper. Even when he gets through charting and analyzing a procedure, only part of what he has observed and reviewed has been committed to paper.

But we would also say that the well-worn cliche with which this article opens contains a great deal more truth than it should. Entirely too many things that occur in the office *do* depend on pieces of paper, as offices operate at this time. Not because there is any valid reason for it, but simply because that is the way things have always been done.

Yet simple logic would show that written communication is the slowest medium of information transfer we can use; that it takes longer to prepare, longer to transmit, longer to absorb than any form of message transmission. Thus, pieces of paper—paperwork —actually slow down the decision making process, and can even delay direct action to the point where a problem that would have been simple to solve if action had been taken promptly becomes really critical.

Thus, the same simple logic suggests that we employ an entirely new approach to our office work patterns — an approach which eliminates paperwork wherever possible. We do not mean by this merely to eliminate duplication of work, or to cut down the number of forms in circulation, or the number of papers filed. All these beneficial results can stem from the overall "Paperwork elimination" technique, but they are not its prime objectives. To concentrate on these restricted areas is a piecemeal approach which really never solves basic problems.

Why is paperwork a synonym for the office? The reason is simple: the office exists solely to work with and produce information, and paper has been the conventional medium for recording information.

But the catch here lies in the fact that paper *is* a medium; it is not itself the essential commodity. That commodity is information. Actually, the office exists solely to use and convert information into certain desired end results.

And information can be transmitted by a variety of media other than paper. Nor is there any real reason for every person using information to have it in written form. As long as he has the facts he needs at the time he needs them, his basic work requirements are satisfied. Whether he gets his information verbally, via recording, from a microfilm reader, over a closed circuit television network, or by means of magnetic tape, makes no difference.

We are often forced to bypass paper-

Mr. Shiff and Mr. Negus, president and vice president, respectively, of Naremco Services, Inc. (National Records Management Council), New York, have both been pioneers in the development of new techniques to reduce paperwork costs.

Why not make our "records centers" into "information centers" so that . . .

work in the interest of time only to find in so doing that we have established an effective and streamlined new method.

The only time anyone in an office must have in his possession written records, then, is when he is dealing with exceedingly complex or detailed information, or with data which he is using continually in his work and which has not been committed to memory. Information which he needs only incidentally, or information which he may wish to refer to only once in a long, long period need not be in his possession at all—as long as he knows where and how to get it when he does need it.

It is just unfortunate that many of us build up too much documentation on the pretext of meeting legal requirements, or create and maintain many unnecessary records and reports as an "alibi file" or a mound of paperwork to impress the "boss." We occasionally don the bullet-proof vest to prepare for people who insist on formally acknowledging, in writing, casual meetings and telephone conversations.

But suppose we do agree that our executives will receive in written form only the information which is essential to their work, and which must be in written form because of complexity or detail. All other information which they may only need incidentally will be available to them—if they request it—but it won't be sent to them automatically.

So far, that doesn't seem too radical a proposition, perhaps. After all, isn't a central filing department based on this principle?

Supposedly—but how many central filing departments actually operate as an information center ready to furnish requested information in response to a telephone call, rather than as a repository for file folders, or even just pieces of paper? Unfortunately, the emphasis in filing has been on the "single file" arrangement of pieces of paper (like soldiers moving in file on the parade ground or Indians trooping through a forest path). Our real emphasis should be on orderly and logical arrangement of information designed to meet the company's information needs, and the individual information needs of departments within the company. Here is a real challenge and frontier for development—and we can look to the file computer as only the beginning.

One phone call saves eight steps

But let's see what we can accomplish by just following our new principle of eliminating paperwork itself wherever possible. Suppose an executive wants to refer to a letter of June 16, 1953, for a point of information needed in a letter of January 15, 1959. Under conventional procedures, he would tell his secretary, who would notify central files which would select the letter required, check it out on a loan slip, and send it to the executive. He would find the particular point of information required, and presumably, immediately return the 1953 letter to his secretary. She in turn would then return it to central files, which would make a record of its return, and put it back into file.

Why wouldn't it be simpler for the executive in question to call central files when he needs the information from June 16, 1953, tell the record clerk what is needed, and let her read the required facts over the phone? He could note them on a scratch pad, if they are particularly complicated, or tell his secretary to make a note in her dictation book for use in the letter he plans to dictate. If it is a relatively simple piece of information that he needs he could usually depend on his own memory to serve him when he does dictate his January 15 letter.

In either case, a phone call has eliminated:

One messenger trip between executive and central files.

One check-out procedure, involving the creation of another piece of paper.

One messenger trip between central files and executive.

One more paper on the executive's desk.

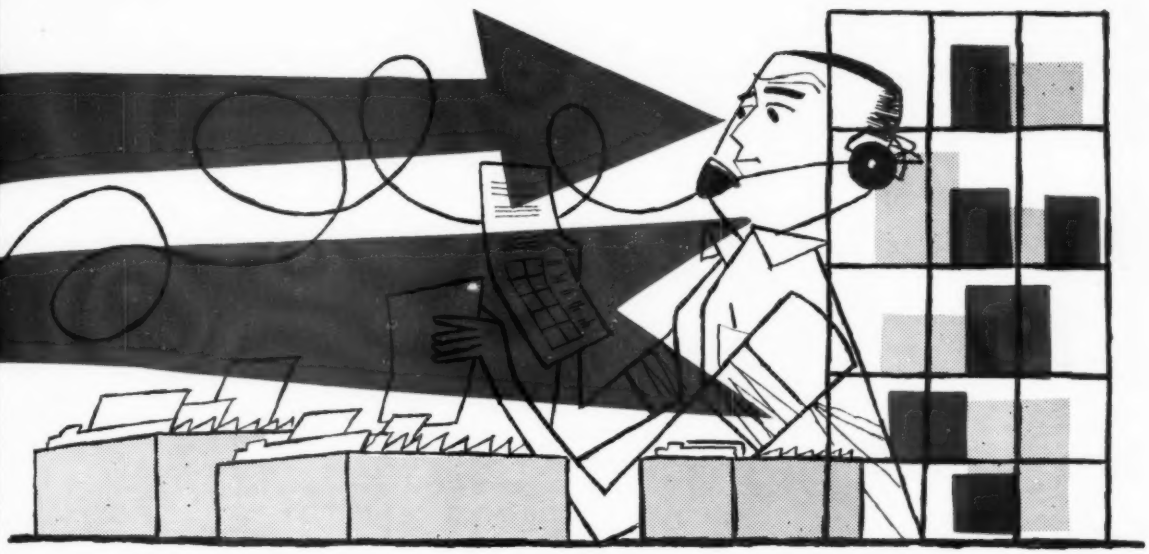
One time lag when a record which might be needed by someone else in the company is out of the control of central files, and therefore not available to the second man.

One good possibility that the record might be lost altogether.

One more physical transfer of record from executive back to central files.

One more recording procedure in central files as the return of the record is duly noted.

In addition, the telephone communi-



. . . a simple 'phone call could give an executive whatever information he needs?

cation would give the executive the information he needs when he needs it—not some hours later when the basic record, after two messenger trips and a check-out procedure, has been delivered to him.

And this saving in time and effort all results from a simple refusal to view the written record as the only possible means of information transfer.

This is only one small possible application of the proposed reversal of viewpoint, of attempting to find every possible place where paper as a communication medium can be replaced by some other medium.

We believe this is the newest and most meaningful approach to systems work. We believe that this approach could simplify systems revision, and make far more meaningful systems improvement. It is total "information management" because forms reduction, improved filing practices, and elimination of superfluous reports and papers can follow from it automatically, whereas the conventional approach to systems revision attacks each of these areas in a piecemeal manner, involves a tremendous amount of labor, and usually produces far less spectacular results.

Thus, the conventional approach to systems revision implies a laborious flow charting of all the paperwork channels of the company, a painstaking collection of all forms and regular reports used in the company, and then a time-consuming matching of forms and reports to the charted paperwork flow. Only after this entire process is completed, does some simplification and consolidation of forms take place and some reduction of the number of reports.

The conventional approach starts at the bottom with the basic clerical worker, studies what he does and what he produces, traces the results of his work to the next step, and so on. It climbs the paperwork pyramid from bottom to top. It then attempts to trim down the existing structure to improve it as much as possible, and to lop off entirely extraneous growths which have appeared on it.

But we believe the "let's get information" approach is not only simpler and easier but promises to give much better end results. We believe it will also result in a structure much better adapted to modern conditions than a streamlined pyramid.

We propose that the correct systems approach should be at the top level first, and should from that point work its way down to the bottom clerical levels. All information filters from the bottom clerical level, where original source data is first received, to the executive suite. Ideally, it goes through a series of consolidations at intermediate levels.

Our consulting experience testifies to the fact that, regrettably, much of this consolidation does not take place at intermediate levels—and company presidents will bear this out. Instead, as basic information is passed up the line each level adds on comparisons, interpretations and different emphases —all of which tends to insulate and remove top management from the firing line. This being so, the best approach, it seems to us, to reducing the paperwork burden is to insure that every bit of superfluous information is eliminated at the top management level, then every bit at the level below that, and so on.

A vice president in charge of sales requires certain basic categories of operating information concerning orders, inventory, sales expense, sales forecasts, etc.—all of which need not be submitted at the same time interval. This information must be organized and managed to reach him at periodic intervals based on his need to be kept informed, to make decisions and to take action. The information must be fresh (current) and if he requires it on a daily basis, round figures or close estimates will suffice in order to reach him "now." If he has to wait until the second week of the following month after the action has taken place, he might find that six weeks have gone by without necessary corrective action taken on a serious problem.

In other words, we propose that the best approach to paperwork control is analysis of the executives' jobs first to see precisely what information each of these men needs to do his job. Let's assume the vice president needs five basic operating facts for his day-to-day work. Let's eliminate everything coming across his desk that isn't concerned solely with those five basic categories of information, and let's see that the reports he receives on those

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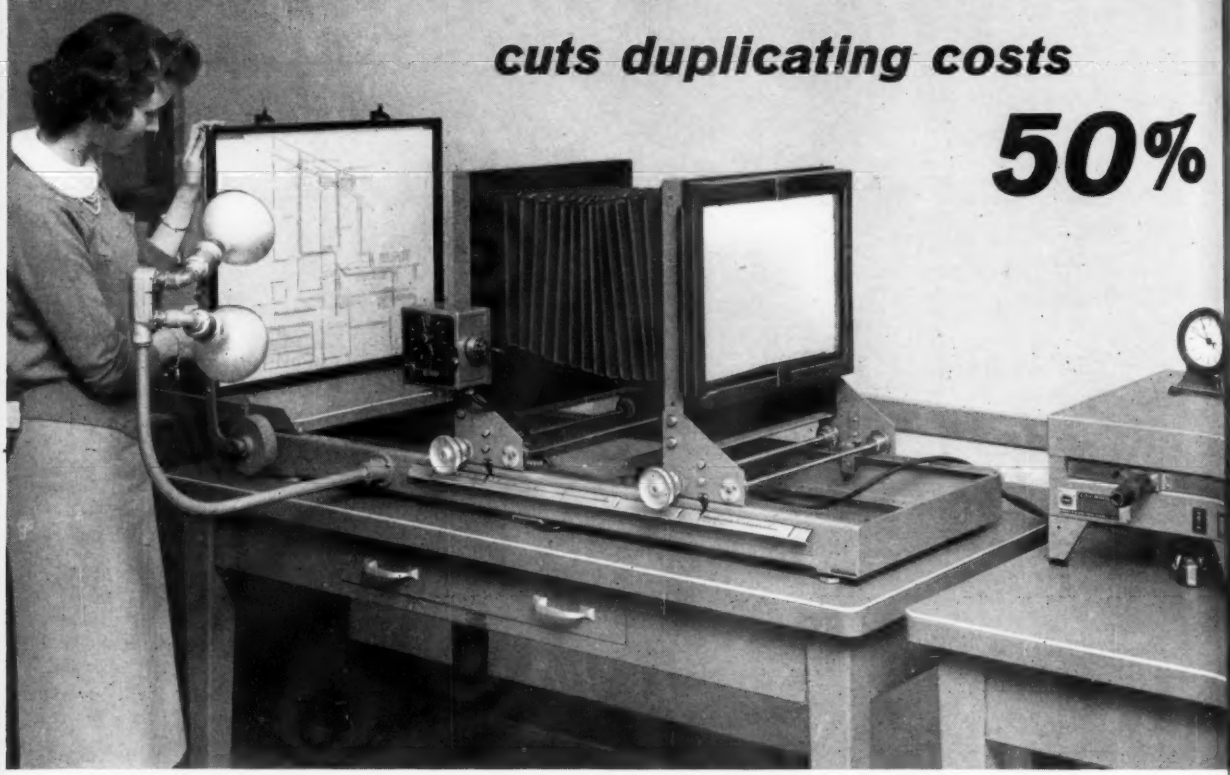

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The fundamentals of a sound employee information program

***Its employees** are a company; their spirit, morale, and identification with the concern are vital to its welfare. These media can help "sell" employees—*

by Robert G. Black

com-mu'ni-ca'tion, *n.* 1. Act or fact of communicating. 2. Intercourse by words, letters or messages; interchange of thoughts or opinions. 3. That which is communicated; a verbal or written message . . . .
—*Webster.*

"Today, top management and supervisory personnel are spending well over 90 per cent of their time in just the simple mechanics of reading, writing, listening and talking to communicate the information necessary to conduct their business and motivate their people."

Walter A. Dobson, vice president of Savage-Lewis, Inc., made this statement recently and added: "Furthermore, in its efforts to speak to its employees, business has spent hundreds of millions of dollars in turning out pamphlets and magazines by the ream, in producing movies and establishing special training departments and visual aids sections."

In this article we shall only attempt to cover some parts of employee communications today. There are, perhaps, two basic fields: (1) Operational communications which give information necessary to run the firm and (2) Inspirational communications designed to provide information necessary to motivate and inspire people.

It is axiomatic that you cannot reach every employee with every publication. It likewise follows that you can't get your message through to some people on the second or even the third try. No company with a successful employee communications plan today relies on only one form of communication.

Mr. Black, a former editor on the staff of Geyer-McAllister Publications, is head of the Employee Relations Group, Public Relations Department, New York Life Insurance Company. He is also editor of that company's monthly publication *NYLIC*.

Charles S. Steinberg, in his book *The Mass Communicators,* points out that "More than any other public—management, dealers, consumers, or stockholders—the employees are the company. They are the most important word-of-mouth organ of public opinion

about the organization to the community at large. And, as a consequence, employees constitute a tremendously significant public relations area."

There are many avenues of communication open to today's management. Eight major ones are:

1. The company publication (house organ), either a newspaper or magazine.
2. Company bulletin boards.
3. Supervisors' Newsletter or Bulletin or Items for Middle Management.
4. Reports to employees.
5. The employee handbook.
6. Reading racks.
7. Letters.
8. Daily news bulletins.

1. *The company publication.* Four years ago, it was estimated that American business and industrial establishments spent more than $100 million annually for 6,000 employee publications, which is rather convincing evidence of their cash-register value. In 1958, according to Gebbie's House Magazine Directory, there were some 8,000 publications with a circulation of 150 million.

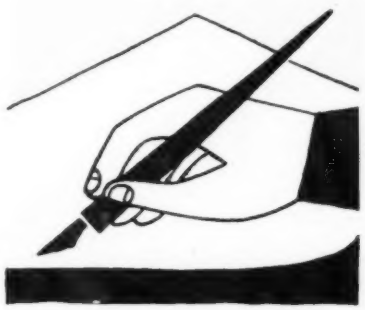
The first requirement of any piece of employee literature is that it must be interesting enough to read. The employees have neither paid for subscriptions nor asked to have one sent or given to them. They get it for nothing and some employees probably think that's what it's worth.

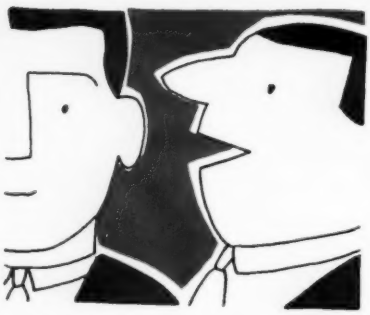
An employee publication must give the reader information of value and interest to him. This means that the day of the "personal notice" is passing.

In a reader survey (and these are not to be taken as gospel, but rather as indications), L. E. Finley of the National Cash Register Company found that employees were more interested in news about the company than they were in news about other employees.

An obvious exception to this might be found in smaller offices or plants. But in bigger operations, nearly every poll of employees showed the same results that the one at National Cash indicated. National Cash, by the way, has even devoted full four-color editions to such items as a tour of Russia by top management and an issue on the United Nations.

Two other examples of companies finding the same interest in company over personalities were Socony-Vacuum Oil Company, Inc. and the American Optical Company.





The Chamber of Commerce of the United States has issued, as part of its continuing American Opportunity Program, a book called *How to Tell Your Business Story in Employee Publications.* It lists the following ten objectives for employee attitudes toward business:

1. Interpret company polices to employees.
2. Keep employees informed about new company plans and developments.
3. Promote employee cooperation and loyalty through better understanding of company problems.
4. Explain financial structure and operation of company.
5. Expose rumors that breed misunderstanding.
6. Nullify harmful propaganda from anti-business sources.
7. Promote an employee-company-family concept of mutual aims and interests.
8. Build a favorable attitude toward the company on the part of wives and children of employees.
9. Foster friendly press relations.
10. Build community goodwill for the company.

William G. Caples, president of Inland Steel Container Company, in an address to a group of industrial editors in Chicago a few years ago quoted from the *Labor Relations Advisory Letter:* "'If *management* does not undertake to tell its story to employees, *no one else will.* The *effectiveness* of management's story will, however, depend on : (a) How sound the story actually is; (b) How well it is told; and (c) whether it is told over the course of the year or saved for an "emergency." You can't blame employees for being a little suspicious of management communications that appear only in times of tension or friction.'

"To my mind," Mr. Caples continued, "a company publication should meet company problems, deal with them and report accurately and fairly the management's viewpoint toward these problems and their probable or hoped-for solution. An employee publication must be specific and straightforward."

2. *Bulletin boards. The Handbook of Employee Relations* edited by John Cameron Aspley and published by the Dartnell Corporation outlines six logical uses of bulletin boards:

1. Notice of changes in working conditions, hours or pay.
2. Notice of changes in personnel—promotions, job posting.
3. News regarding expansion of plant or business.
4. Information about new equipment ordered.
5. Information of personal interest (trips by employee organizations, etc.).
6. Testimonials from satisfied customers.

Mr. Aspley points out that "in posting testimonials from satisfied customers, the purpose is to arouse pride of craftsmanship throughout the entire organization."

Too often, in today's large firm, the individual does only a small segment of a job. He or she tends to have little pride in the overall job well done.

Another meaningful use of bulletin boards is to run advances of your company's ads. If your agency provides them, have them leave the magazine and date of publication on the ad. Often, your people will look for that ad when the issue appears and point it out to friends.

Keep bulletin board news fresh

Continental Can Company recently made a study of bulletin boards as media in employee communications. As a result of the study, Continental Can reached the following conclusions:

1. Bulletin boards, in themselves, possess attention value and should be attractively designed. There should be plenty of them strategically placed.

2. As an advertising medium, bulletin boards can be equally useful, with respect to management-employee relations, as are other advertising media in connection with sales of the company's products to customers.

3. Uniformity in the medium for presentation is, in our case, a prerequisite to achieving greatest efficiency.

4. Bulletin boards in a plant represent management to personnel. Since they serve to keep employees informed about activities of their company they must conform to the highest standards of good plant housekeeping and orderliness.

5. Overcrowding is a common practice to be avoided. The worker should be able to read and comprehend all materials on a bulletin board in from 2 to 4 minutes.

6. Only fresh news has attention-getting power. Messages changed frequently keep the bulletin board interesting and up to date. Notices and displays left up too long become stale and eventually detract from the value of the display area.

7. All bulletin boards should be spotlighted to get attention and to facilitate reading the notices.

3. *Items for middle management.* An effective way of communicating with your supervisory staff, particularly in a large organization, is that used by such firms as General Electric, Allis-Chalmers, Eastman Kodak, AT&T, R. J. Reynolds, DuPont, and many others.

These supervisory news bulletins should give your managerial staff a feeling of access to top management; on the other hand they should give top management a fast line of communication to department heads and close contact with the supervisory group . . . answering their questions.

In the booklet *Developing Effective Supervisory Newsletters,* by Robert Newcomb and Marg Sammons, published by the American Management Association, the authors point out that "It is axiomatic in the field of employee communication that, when you put it in print, it's in the public domain."

The authors made a breakdown of 50 of the country's better supervisory newsletters and found some 90 items often covered in such publications. A few of the subjects found to have an effect on supervisors' attitudes were: accident prevention; advertising — reviews and previews; automation; awards to the company or groups or individuals within the company; bonus — discussions or changes; business conditions; community campaigns; communications with employees; cost reduction; company expansion; competition; contests—sales or employee; customers—names of (particularly important ones); films and showings; fringe benefits; industry news; insurance changes or clarifications; job responsibility; labor developments; lay-

offs; legislation—importance and interpretations; meetings; methods improvement; motivation; notices; operations; organization charts; products; production control; promotions; questions and answers; recruitment; reports—annual and otherwise; retirements; sales — records and goals; savings bonds; speeches—extracts from; social security; suggestion program; supervisory authority and responsibility; supervisory training and meetings; taxes; and others.

A supervisory letter must have material that your supervisors want to have; it should reflect their desire and need for information. It should be reviewed regularly by top management to see that it is doing its job—and whether it can do a better and more comprehensive job. . . . It should not be routine.

4. *Reports to employees.* In your annual report to employees, if you provide one, you should consider some or all of the following questions which almost every employee asks about his own firm:

1. Company history.
2. What policies have made it succeed?
3. What is the extent of its present activities?
4. How does it rate in comparison with other companies in the same line of business?
5. Where does its revenue come from?
6. What percentage of its sales dollar is profit?
7. What are its principal expenditures?
8. How much money is paid out for wages and salaries?
9. How much money is accumulated for taxes?
10. How much money is spent for plant upkeep, etc.?
11. How much is paid out for freight and transportation?
12. How much money is set aside for interest?
13. How much money is used for employee welfare activities?
14. How much money is reserved for plant depreciation?
15. What is the investment per employee?
16. What money is it putting aside to protect the worker's stake in the company?
17. What money is it putting aside to protect the stockholder's investment?
18. What is it doing to stabilize employment of workers?
19. What is the company's research program?

Obviously the 19 questions above are not applicable to every business. But, roughly, they are of general interest to most employees of the average business concern.

5. *The employee handbook.* This is your new employee's key to the company. Most firms have put into their handbook material such as that described below. Of all publications, this is the one that you most probably already have.

It should cover:

1. Company history.
2. Some company organization.
3. Working hours and other regulations of the company.

(*To page* 185)

Reading rack services, while not telling an individual company's story directly, are popular with employees, and help instill a viewpoint sympathetic to company problems

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Use Readers' Inquiry Coupon on Page 188

OFFICE LAYOUT and FURNISHINGS

Formula for efficiency

No office can be more efficient than its layout and its equipment permit it to be. An efficient work flow demands intelligent functional design; good work is best accomplished in an environment that is cheerful and uncluttered; moreover, the furniture of the office must be more than merely decorative. It is part of the working equipment of the office; its design, besides being attractive, must aid each employee to accomplish his work in the simplest, most direct manner possible. These are the reasons why "the physical office" must always be a primary concern of administration.

Office building and office layout planning

Excerpts from the book "Office Building and Office Layout Planning," which will be published by the McGraw-Hill Book Co. in the spring of 1959.

by Kenneth H. Ripnen

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THE INDIVIDUAL worker, seated at his or her desk or work table, is not only the basic unit of an office; the basic working area which he has completely to himself is the foundation of all space planning and administration. Determining the space allotment for each worker is the beginning of our determination of space standards for the office as a whole; we work in space from the individual to the overall plan. If we do not, we're liable to find that quarters have been rented that simply won't accommodate all the company's workers.

And to a degree the amount of space given each worker reflects the atmosphere of the office as a whole—for individual space allotments can be either economical or liberal. The finished office will more often than not be characterized throughout by the type of thinking first indicated in the determination of individual space standards. Other factors will operate to set space standards too, of course; in an industrial corporation, where many of the jobs to be performed are of a strictly routine character, it is common practice to employ a small or economical space standard for individual workers, although complex operations requiring bulky equipment will usually dictate a more liberal space allotment. In general, in offices where specialized work is done and there are many visitors, or where a strong effort has been made to promote high worker morale, a generous space allotment will be used.

In either instance determination of the actual working space reserved for each worker, and determining the increased amount of space to be given each higher echelon in the company table of organization, is the very first step in scientific space planning. And within our limits of generous and economical individual space standards, certain broad trends for various types of offices can be seen.

Government office space, for instance, like the average large corporation's space for routine clerical positions, will usually be set up on economical standards. Institutional organizations, such as banks, insurance companies, and very large corporations with great numbers of clerical workers will also tend to use economical space allotment standards in areas where there is little contact with the public. The reason is obvious: generous standards in very large organizations mean greatly increased rental or building costs. Smaller offices, and more personalized organizations, which do not have great numbers of clerks engaged in routine clerical operations, may profitably use much more liberal standards even on the basic clerical level. And by the same token, the same institutional organizations—banks, insurance companies, etc. — that set compact space standards for their internal processing departments, must alter their basic space standards, even for routine workers, in departments where there is a considerable degree of contact with the public.

Before we go any further, and discuss particular space allotments appropriate to various types of workers, let's define our terms. Space allotment, as we have said, is the number of square feet required to house a person or a department. But "square feet" itself can mean a variety of different things, can be interpreted in many ways.

To the office manager, "square feet" means the amount of space required to accommodate a desk and a chair, plus a waste basket, occasional file or bookcase, a department or work row aisle, and, perhaps, a clothes rack. The office manager, in other words, is concerned with "net assignable space." "Square feet" to the architect or building manager means the entire area of a single floor, including building corridors and service facilities, which the office manager often ignores in his reckoning. The former is thinking in terms of net square feet; the latter in terms of gross square feet.

This may seem to be laboring an obvious point, but the essence of communications is a common agreement on terms, and planning office space is a matter of many points of view being meshed together. Varying use of basic terms can cause confusion in the beginning and bad results in the end. Even such a simple term as "square feet," when used by a variety of people, each with a different conception of its meaning, can create a great deal of confusion and trouble. The office manager, as well as overall management, is interested in usable office space when discussing assignment of given areas with department heads, with a landlord in rental quarters or with architect, engineer, or builder dur-

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Mr. Ripnen, president of the New York architectural firm, Kenneth H. Ripnen Co., Inc., was one of the first architects to specialize in the field of space planning. He has been a frequent contributor to this magazine.

ADDRESS:
FLOOR:
DEPARTMENT:

ANALYSIS SHEET
ORGANIZATION - EQUIPMENT & SPACE
AS OF 195
PRESENT ☐ PROJECTED ☐

PREPARED BY:
KENNETH H. RIPNEN CO., Inc.
ARCHITECTS
OFFICE LAYOUT & OFFICE BUILDING CONSULTANTS
640 4th AVENUE
NEW YORK 16, NEW YORK

JOB No. | PAGE
DATE:
DEPT. SHEET No.
OF ..... SHEETS

DEPARTMENT PERSONNEL		NUMBER OF EMPLOYEES			PRIVATE OFFICE		GENERAL OFFICE			SPECIAL AREAS			TOTAL AREA	EQUIPMENT USED				OTHER SPECIAL EQUIP.	CONTACT WITH OTHER DEPARTMENTS AND REMARKS
JOB TITLE	NAME	Male	Female	Total	Square Feet	Pers.	Square Feet	Personnel	Area	Square Feet	Pers.			Desk	Telephone	ELECTRICAL MACH. On Desk	ELECTRICAL MACH. Separate		

Original analysis sheet used to determine present space assignments . . .

SUMMARY OF SPACE PERSONNEL
AS OF 195

PREPARED BY:
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640 4th AVENUE
NEW YORK 16, NEW YORK

JOB NO. | PAGE
DATE:

PRESENT LOCATION			PRESENT				PROJECTED				
BUILDING	FL.	DEPARTMENT	PERSONNEL M	PERSONNEL F	PERSONNEL TOTAL	TOTAL ASSIGNABLE AREA SQ. FT.	TOTAL ASSIGNABLE AREA SQ. FT.	PERSONNEL M	PERSONNEL F	PERSONNEL TOTAL	REMARKS

. . . and summary sheet to which present and projected space needs are posted

ing the period of construction.

So to make the various terms used by these latter groups clear, the distinctions between net and gross rentable space should be drawn. To clarify these meanings, we quote from a pamphlet published by the Real Estate Board of New York, "Standard Method Floor Measurement for Office Buildings":

"Single Tenancy Floors"

"The rentable area of a single tenancy floor shall be computed by measuring from the inside surface of the outer building wall to the inside surface of the opposite outer building wall.

"Rentable area of a single tenancy floor shall *include* all areas within the outside walls, *less* building stairs, fire towers, elevator shafts, flues, vents stacks, pipe shafts and vertical ducts, with their enclosing walls, serving more than one floor.

"Private stairs, private elevators, toilets, air conditioning rooms, fan rooms, air ducts, janitors' closets, slop sinks, electrical closets, telephone closets, with their enclosing walls, within and exclusively serving only that floor, shall be *included* in rentable area.

"No *deductions* shall be made for columns and projections necessary to the building.

"The area of air conditioning and fan rooms located on a rentable floor, serving more than the floor on which located, shall be *apportioned* and *included* as rentable area of the floors they serve.

"The rentable area of an individual office or a portion of a divided floor shall be computed by measuring from the inside surface of the outer building wall to the finished surface of the corridor side of corridor partition and from the center of the partitions that separate the premises from adjoining rentable area.

"No *deductions* shall be made for columns and projections necessary to the building.

"Building stairs, fire towers, elevator shafts, flues, vents, stacks, pipe shafts, vertical ducts, toilets, air conditioning rooms, fan rooms, air ducts, janitors' closets, slop sinks, electrical closets, telephone closets, with their enclosing walls, shall be excluded from rentable area."

In addition to drawing the distinctions between gross and net square feet, a few other terms which will be used throughout the book should be defined here.

The first is module. When considering general interior office space, we will be talking about *space modules* and *functional modules*. We will also be talking about architectural, or structural, and mechanical modular design and construction.

To begin at the beginning, module is a "standard or unit of measure" by which the proportions of a building or structure are judged. Adapting this term to the office, a functional module then refers to a unit of space required to perform a specific office function. The module, once adopted, is repeated for every station that must perform that function. When we talk about a private office, we are considering a functional module. And when we use modular space planning, every private office for a certain rank of executive will have the same space. The module for one group may incorporate two hundred square feet; it may be set up as three hundred square feet. Whatever area is established, it becomes the standard for all private offices for executives at this particular level in the organization.

Similarly, in an open general office, we might establish the office worker's functional module as eighty square feet; that is, we would establish as our standard an allotment of eighty square feet for each individual.

Structural modular construction re-

fers, as its name implies, to a structural or architectural unit. When we say that a building is constructed around twenty-foot bays, we mean that the supporting columns are spaced twenty feet apart. The structural bay area is four hundred square feet. Under this same condition, the windows on the perimeter of the building might be placed on ten foot centers, which would divide the twenty-foot structural module two times to give us a linear module of ten feet.

And, in the modern office building the structural module is the end result of the requirements of the functional module, just as the office's total space requirements are dictated by the decision as to how much space is to be given to individual office workers and machines.

Which brings us back to the starting point: the basic office worker at his or her work station. We have discussed some of the conditions which lead a company to choose liberal or economical space standards for its various levels of employees. What is the range of such standards; the limit beneath which individual work space cannot go; the area at which it becomes wholly impractical?

Determining the appropriate standards within this range, in terms of the needs and purposes of his company, is the first responsibility of the space administrator in his planning role. It is his responsibility, too, to compromise the functional space modules in existing structures to meet the desired standards, or develop the proper new space modules for office space allotments and structure in new construction. Thus, he must establish space standards before he makes his recommendation as to the total amount of space his company must rent or build in a move to new quarters.

Standards sometimes compromised

If a new building project is being planned, establishing space standards (within reasonable limits) is fairly simple, since the column spans and window modules of the building can be designed to satisfy the space allotment standards finally agreed on. On the other hand, if the office is to be moved into space in an existing building, the space standards may, to a degree, have to be compromised to meet existing space limitations. This problem occurs mainly in private offices, the size of which is often controlled by column spans and particularly by window modules. Arbitrary insistence on predetermined space standards in some existing structures could mean that two private offices, divided by a partition, would share one window—an obviously ridiculous situation.

But using twenty feet by twenty feet as the average structural bay, a variety of private office standards, all falling within an acceptable range, can be established:

Type	*Size*	*Total Square Feet*
A	20 by 20 feet	400
B	10 by 20 feet	200
C	20 by 15 feet	300
D	10 by 15 feet	150

For general office workers, occupying standard 60 by 34 inch desks, we might assign the following space allotments:

Supervisor — 100 square feet
Clerk — 65 to 80 square feet

Twenty by twenty bays are not the only dimensions possible—other spacings may be used, particularly in general office areas where longer column spans may be necessary. The optimum practicable span is about 35 feet. Similarly, depending on whether liberal or economical space standards are set for private offices column spans in such areas might range from 18 to 27 feet. This would permit a wide range of sizes in private offices—from 9 to 13½ feet in width.

Special office equipment and machines will often dictate individual space allotment standards, and all such equipment should be listed, and its space allotment standards established through detailed analysis and planning in order to determine total space required for such machines. This must be done before general office space standards are set. Such equipment is not flexible; it will demand a minimum amount of room which cannot be reduced, and so it must be taken into account before the remaining total assignable space for private and general office areas can be accurately planned.

For the same reason, special areas such as vaults, storerooms, machine, mail, medical services, cafeteria and dining rooms, reception, conference, and service rooms must be planned before space standards for remaining office areas can be firmly established. In rented quarters, the amount of space remaining after these necessary facilities have been planned will often be the determining factor in a company's decision to apply liberal or economical private and general office space standards.

Special areas checked first

The total space allotted to special areas, accounting machine rooms, service facilities, reception and conference rooms is calculated first in estimating space required in new quarters. Then general and private office individual space standards are multiplied by the number of workers in each category to be housed. This total square foot figure, added to the first, represents the net office space required by the organization. Obviously, in moving into an existing office building, the building's present dimensions will to a degree control the space standards decided on; in planning a new tenant-owned building the space standards can be the starting point, and the building can be constructed to meet the individual space standards.

Assuming that a company is not constrained by space limitations in an existing building, is free to set any individual standards that seem desirable, which are better—liberal or economical space standards? What is the difference, what is the range between liberal and economical standards?

To take the last question first, one hundred square feet per general office clerical worker would be generally considered a liberal standard; sixty-five square feet an economical standard.

Now within the ranges quoted for general office standards, which is better, the upper limit or the lower? We generally recommend, whenever it is feasible, that a generous rather than an economical space standard be used. There are three main reasons for this: use of generous standards gives a company a built-in expansion factor; use of the higher standards improves employee morale; and, usually, improves employee efficiency and work output as well.

The expansion factor is an obvious benefit of the generous space allotment. A company occupying rented quarters will often find that it is outgrowing in a few short years the quarters it once thought would be adequate for a long period of time. If it has used minimum space standards for workers in its planning, and has not reserved expansion space elsewhere in the building, it very often will have to split its office force between two

buildings, or move its entire staff into larger quarters. Use of generous standards in the first place gives the company a built-in contraction possibility which gives it expansion space. As it expands, if adjacent space is not readily available in its own building, it can, by reducing its individual space standards, accommodate an increased number of workers without additional space. When more space becomes available in the rental building it can take another floor or half-floor, and return to its original generous standards. The company which has stipulated economical standards from the first does not have this time advantage when it needs to house more workers; it must find additional space immediately.

Morale and efficiency also increase as space allotments are made more generous. Desks separated from each other rather than abutting each other give each worker more of a sense of pride and prestige in his job; less of a feeling of being part of an assembly line. Moreover, a spacious uncrowded office, aside from the intangible prestige factor in the workers' minds, is usually less noisy, and more relaxing physically than one that gives an impression of being crowded.

Efficiency, the final argument for generous space standards, is the least obvious of the factors which lead us to urge adoption of the high standards, but it is a very real benefit. When workers' desks are separated, the incidence of gossip, of passing the time of day, of exchange of confidences, drops noticeably. If desks are separated, one worker has to get up and move to another's desk if in the mood for a little casual conversation. This is not only more obvious to the supervisor than long, personal discussions between two workers whose desks abut; it's also more effort for the worker.

Offices that give their workers the benefits of individual desks in adequate space usually find themselves more than compensated for any extra cost involved, through an increase in total clerical work output.

Once desired space allotments standards for the new office layout have been decided, it is possible to prepare a formal program of office space requirements. But so far, we have simply established standards for various categories of workers. Now it is necessary to find out just how many of each group of workers there are in the organization—any special requirements any of them have that will dictate a compromise in the standard, and any departmental information which will necessitate additional space—over and above individual space allotments for each worker—for the department as a whole.

Survey determines needs

We do this through a survey of our present office space, and how it is used —a survey which takes in every office worker—his machines, equipment and furniture—in the organization.

The survey can be accomplished easily by use of analysis forms based on the one shown, and a detailed base sketch of present office layout, for calculation of present office areas. Such forms should be typed, preferably on transparent paper with a reverse carbon backing for use in creating additional needed copies. These forms are completed for each department by a liaison person within the department working with the space administrator. In using the forms, a department may use as many pages as is necessary to list its requirements, but it is best and simplest to stipulate that two departments cannot be listed on the same page.

Information should be entered horizontally across the form for each individual office worker in each department in the following manner:

1. Job Title (Column 1). A job title should be entered for each individual in the department. In the case of secretaries or stenographers, who should be placed close to the executives for whom they work, the job title should include the executive's name—"Secretary to Mr. Jones" or "Stenographer for Mr. White and Mr. Greene." This added information can be entered in Column 1 or 10.

2. Room Number. The room number, if any, should be entered on each line in the left hand marginal column opposite the jobholder's name to simplify location of individuals and departments.

3. Name (Column 2). Each individual in the department should be listed on a separate line, with emphasis on accuracy in spelling both job title and name to avoid possible confusion. Personnel of each section and division within the department should be listed together, and three blank lines should be used to separate each divisional group from the next.

The succeeding main column divisions are each broken into sub-columns for individual information purposes.

Column 3—Number of employees is divided into three sub-columns, Male, Female, and Total. A checkmark in the male or female column indicates the sex of the particular employee. The "Total" column is used only for a final figure at the bottom of the page of all male and female employees listed on the page, so no entry is made on the individual horizontal listings.

Column 4—"Private Office" has two sub-columns, "Square Feet" and "Personnel." If the individual occupies a private office, the total square feet taken by that office are entered in the first sub-column. Since "Private Office" in this context includes an office shared by an executive and his secretary, the number of people actually using the offices is entered in the second sub-column "Personnel." Generally, occupancy of any office area by three or more people will take it out of the "Private Office" category, and classify it as general office space.

Column 5—"General Office" is divided into three sub-columns, "Square Feet," "Personnel" and "Average." If the individual occupies general office space, the number of square feet presently occupied will be entered in the first sub-column. Personnel and Average sub-columns are both used for final totals at the end of the listing of the entire department's personnel, so no entries are made at this point.

Column 6—"Special Areas" has as sub-columns "Square Feet." and "Personnel." If the individual being listed works in a "special area" (file room, storage area, reception room, cafeteria, library or vault, that fact is indicated by a check in the Personnel columns. (Square feet of space given to such special areas are not noted by the department, but rather by the space planner).

Column 7—"Total Area." Whatever square foot area has been listed for the individual worker in Column 4, 5, or 6 is re-entered in Column 7 for eventual totalling of the entire area occupied by all workers in each department at the close of the listing of department personnel.

Column 8—"Equipment Used" is divided into four sub-columns: "Desk," "Telephone," "Electrical Machine on Desk," "Electrical Machine Separate."

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Wood furniture maintains its popularity as prestige symbol for executives

But manufacturers are also stressing durability, new, sleek designs, easy maintenance, and competitive costs —

by Lyman Coddington
Associate Editor, *Office Management*

INDICATIVE of the value placed upon wood office furniture by some executives is a story appearing in the book *Is Anybody Listening*, by William Whyte, which tells of an executive who was inadvertently assigned to a desk made from a material other than wood. Reading all kinds of implications reflecting a lowered status into the situation, the executive was very disturbed until he learned that the assignment was a mistake, and that he was to receive a wood desk after all.

Although this is an extreme example, it attests to the importance of wood office furniture as a material which carries prestige—a factor which continues to be the prime consideration where wood furniture is concerned. Executives particularly, since they realize that the office is the epitome of their expression and personality, demand furnishings which will convey a favorable impression to friends, customers, clients and associates. They feel that wood, because it holds a natural warmth and beauty, is the office furniture material which will best fulfill the desire for status and individuality in furnishings.

And the wood office furniture industry, which is comprised of approximately 35 manufacturers in all, has not been hesitant about stressing the element of prestige in its products. "The lustrous gleam of fine wood in all office areas is admired by everyone," manufacturers report. "Handsome wood office furniture is universally recognized as the finer way to show functional dignity together with the warmth of cordiality which makes and keeps business friends," the manufacturers declare.

Nonetheless, the facts show that the wood office furniture industry cannot stand fast on a campaign emphasizing prestige. The total sales volume of both metal and wood, including files, shelves and other accessory items, was $365.8 million in 1957, according to the U.S. Census Bureau. Of this amount, $69.1 million was accounted for by wood office furniture. The Wood Office Furniture Institute reports that the 1958 sales volume should be about the same.

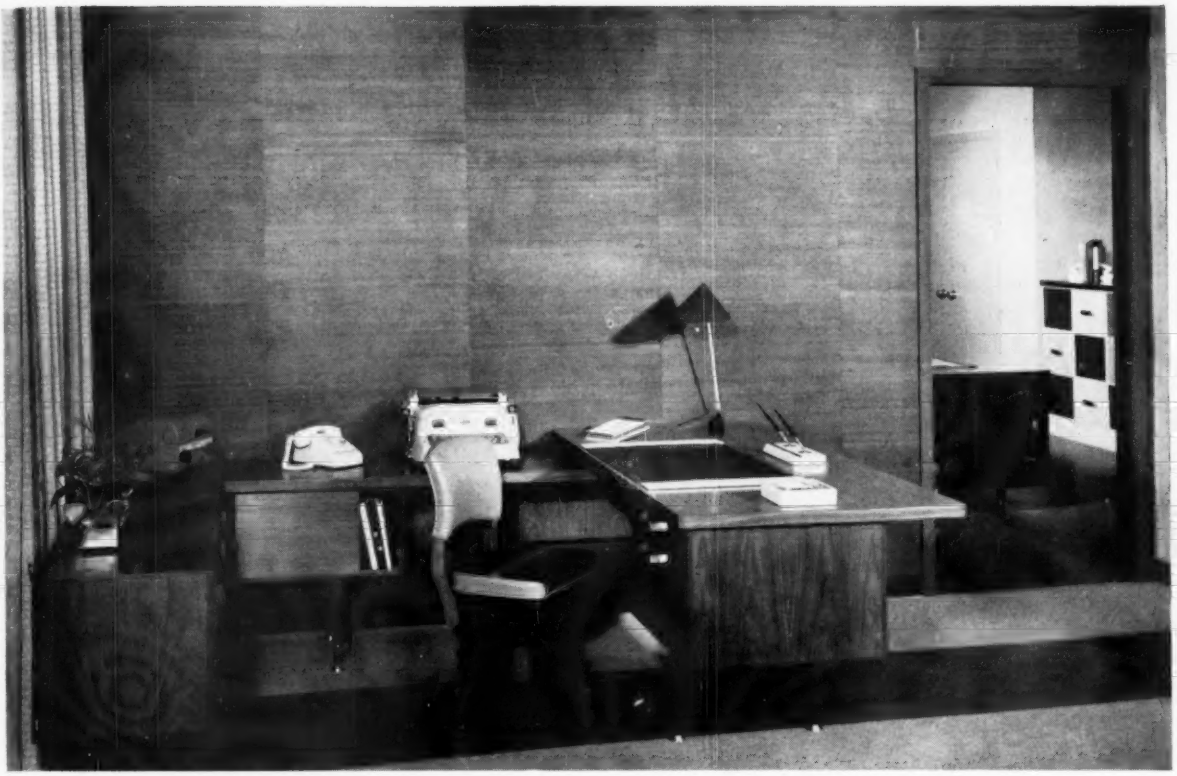
But in 1956, sales volume for wood furnishings stood at $73.8 million. Whether the recent dip in sales reflects the consequences of the recession is a moot question. The point is that in order to take a more sizeable chunk of the growing office furniture market—the Wood Office Furniture Institute estimates that total wood and metal furniture sales should top $600 million by 1965—the wood office furniture industry is campaigning on a broad scale which emphasizes not only prestige, but also durability, style, price, maintenance cost and even fire resistance.

According to companies which manufacture wood furniture, this material has more proven durability than furniture of other materials. They point out that wood furniture hundreds of years old is still in service in many offices, and that there is still a heavy demand for the roll-top desk, a product that ceased to be made at the time of the Model T Ford.

Only hardwoods such as walnut, oak, birch, and mahogany are utilized in the making of wood furnishings. A concept persists among the public that mahogany is the finest and most expensive of these materials. Actually, mahogany is one of the most inexpensive hardwoods on the market today, while walnut is the most popular and one of the higher-priced of the hardwoods because it is not plentiful. All desks are made of hardwood plywood since, due to the fact that it is a pressed material in which stresses cancel each other out, the feeling is that it is infinitely superior to solid wood. Manufacturers note that plywood will easily withstand a heavy blow that would crack the solid top, that it will never warp and that it can display a beautiful grain through the use of an expensive veneer, thus lending the same quality ordinarily associated with only the most expensive woods. Indeed, the wood used for veneer surfacing costs as much as $20,000 for a piece of timber from prime virgin growth. Only by slicing it to thicknesses of 16ths or 32nds of an inch could such material be used economically.

The rash of designs showing Scandinavian influence which have flooded the wood office furniture market in the last three years demonstrates, according to the industry, that flexibility for styling is a major advantage of wood. No expensive tools and dies are needed. Since wood is easily cut, molded and joined, the needs of buyers, designers and architects can be catered to with a minimum amount of difficulty. Wood office furniture manufacturers emphasize that each desk and chair, even when produced on a production line basis, is hand-made and assembled. Such a system, they claim, permits the ultimate in tailoring to meet the call for changes in design.

As far as price is concerned, wood furniture makers point to the Facts for Industry Survey compiled by the U.S. Census Bureau. "Manufacturers Shipments of Office Furniture—1957" reports that the average manufacturer's price of a wood desk was $81.52; a wood chair, $24.99. This is compared with prices of $95.56 and $27.44 for the same products manufactured from steel, thereby dismissing the popular concept that wood furnishings are more expensive than metal. The higher costs of sheet steel over wood mate-



U-shaped arrangement of modern wood desk in reception area combines utility and beauty.

rials has reflected itself in the difference of price between the products of the two.

A desk dropped in transit may suffer a dented or ruptured panel, or a broken or dented post. Wood office furniture companies assert that the part, if made of wood, is easily and inexpensively replaced by a low-cost repairman, while parts made of competitive materials might require major and specialized repairs. Scratches are covered with the wipe of a saturated polish cloth. Drawers on wood desks are chemically treated by dipping or spraying in order to avoid swelling or sticking, and interchangeable drawers are now available on some wood general office lines. A frequent statement made by manufacturers is that the old complaints of splintered desk legs or sticking drawers do not exist with the wood furniture of today. To meet the improvements in desk drawers of competitive materials, wood drawers are now available with nylon guides and full suspension.

The last advantage that anyone might expect from wood office furniture would be its resistance to fire. Yet for any fire other than a major conflagration, wood has been proven to protect paper, without charring, from the same fire that left only ashes in a metal drawer, because it is a poor conductor of heat and acts as its own best insulator when in a charred condition. The only instrument affording better protection in the small fire is the insulated file or safe.

Because desks are made principally of plywood and chairs are entirely solid and often upholstered, separate operations are required in the manufacturing process. Making the desk is a little more automatic, since new adhesives, finishes, and machines have constantly improved the speed and quality of the manufacturing. The full-time chair manufacturer, however, takes great pains with steam bending, intricate molding, and joining. Great care is expended with interior padding and upholstering if the chair cover is to last for the full ten to twenty years claimed by the manufacturer.

The long experience of recognized wood desk and chair manufacturers has been threatened in recent years by a tremendous growth of small, custom "cabinet shops" in such large cities as New York and Chicago. The large wood office furniture companies maintain that despite the craftsmanship of these small plants, it is impossible for them to match the quality of the large manufacturer with regard to such items as desks and chairs. Large companies would compare the activities of the "cabinet shop" to that of the home car builder trying to construct a Detroit production model at a competitive price, constantly hampered by the inevitable "bugs" contained in an original product. Elimination of these drawbacks, according to the large companies, is the very reason that good office furniture is built in factories that manufacture only office furniture.

The furniture industry has advanced considerably since the days of the venerable roll-top desk—a time when wood held an unchallenged position in the office furnishings field. Make no mistake about it, there are still present throughout the country a great number of roll-top desks. However, wood office furniture manufacturers have since been jogged by the inroads of metal interests into their markets. The wood office furniture industry has suffered the largest portion of its market loss in the general office area, the principal reason traceable to the fact that it has been out-produced and out-merchandised. Those in the field of wood furnishings feel that the prestige

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Range of color and design available in steel furniture continues to grow

"Metal" furniture now includes aluminum products as well as steel, extending variety of styles, finishes, and colors available—

A TRANSITION in response to the vagaries of the office furniture market is taking place at the present time as far as steel office furniture is concerned. True, the field of steel furnishings, like all progressive industries, has always been characterized by a state of transition since it constantly strives to meet its competition and the changing market picture. Even so, the steel furniture field finds itself in a more pronounced condition of flux than ever before. Faced with the constantly changing whims which motivate the buyer, demands for new variations in color and style, the increasing importance of the interior decorator and architect in the merchandising of office furnishings, and the entry of aluminum into the market as a new furniture material, steel office equipment companies realize that they cannot stand still, but rather, that they must adapt to meet changing conditions.

That the industry is not standing still is proof of its willingness to adapt. Indeed, the very reason that it is in a transitional state is because of its response to the factors affecting it. The steel office furniture industry is meeting these challenges by employing novel variations in the two basic ingredients of office furniture—function and design. Over the years manufacturers have been using the cardinal principles of function and design in varying degrees and proportions. By attempting to achieve the correct balance between the two, they are meeting the challenge of the present-day market. According to the vice president of one large steel furniture supplier, "beauty of design is one of our most tempting sales points and all-important; yet, unless function and quality are deeply imbedded in the furniture we will never attain the satisfied customer that is the chief aim of our business."

To the makers of steel furniture, past experience has proven that this material has inherent qualities that have never been utilized to their fullest capacity. To gain the full advantages of steel as a material for office furnishings it is imperative that design and function be approached from new angles.

Design is the foundation from which any product must originate. Initially it begins with an idea that accomplishes the ultimate goal from the appearance viewpoint regardless of what complexities may be involved in the manufacturing process. Thus, in steel office furniture, the demand for variety in color has been just one indication of the factors that influence better design in the creation of more pleasant office furnishings. Variation in available colors continues to be a major attribute of steel office furniture. Nearly all manufacturers have added new colors to their furniture lines very recently, attesting to the value and importance of color as a feature of steel furniture. They note that every color, like every individual, has a distinct personality. Just as some people promote gaiety and cheer as soon as they enter a room, some colors will have an identical effect on people entering an office, or they might, depending upon the color, have the effect of causing people to be energetic—making them want to accomplish things.

Steel furniture makers also note that if there is a sharp contrast in color brightness such as the contrast between a white paper and a dark desk top, the eyes are forced to make very rapid adjustments. Reduced efficiency, and lowered quality of work will often result from the cumulative effect of eyestrain and fatigue caused by these constant readjustments. The answer to this is color conditioning, which is brought about by reducing sharp contrasts in office color through the use of steel furnishings that match the color scheme of the office.

Satisfaction of these ends is just one reason for the large variety of hues and shades available in steel furniture lines. Such a wide range of stock colors are now available that the buyer no longer needs to have his furniture custom-made in order to obtain a particular shade. Practically every conceivable color is carried in the regular stock lines. This includes such variations as grained finishes in mahogany and walnut, including finishes which, by means of hot spraying and polishing literally stand out from the undercoat. New horizons are opened for the personalizing of an office to the precise taste of an individual.

Another reason for the emphasis on color in steel furniture is because many buyers, in spite of all their outward concentration on the functional aspects of the material, are governed mainly by eye appeal when making a choice. Steel furniture makers are therefore ready to adapt their styles to match the whims and notions of the potential buyer. Many people are involved in the purchase of office furnishings, and these people embrace different ideas when it comes to the style of furniture to be bought. Furthermore, according to office standards, there are no mathematical yardsticks to measure the value of a furniture purchase as there are, say, in the buying of office machines. Results of the purchase, whether favorable or unfavorable, can be checked only after the installation is made. That the businessman has no specific yardstick to consider does not mean that he can rely so completely on esthetics in furnishing the office as the housewife can in furnishing the home. Instead, he must remember the operational efficiency of the office in making the pur-

Metal furniture has established complete predominance in general office areas

chase. Nonetheless, esthetics, primarily in the form of color, influences his reasoning when he buys.

Emphasis on color, however, does not preclude the fact that furniture buyers do consider other aspects before making a selection. For the standard purchaser of office furniture, the following factors will enter into the final decision:

Progress—the feeling that some steps toward modernization have taken place. Most people want to be up-to-date and progressive. They want the furnishings to reflect a modern and forward-looking concern.

Security—the buyer wants to feel that he has made the correct choice.

Comfort—not only physical comfort, but also psychological comfort.

Status—quality and taste, as well as size of the furnishings, are all important in telling others of the individual's status.

Individuality—the executive likes to know that the design of his office sets him apart from his associates—that it expresses his attitudes, even though the decor should be practical and functional.

To cope with these factors that motivate the potential customer, steel office furniture suppliers are striving to come up with new variations in function as well as color design. New lines are being introduced constantly, and phrases such as "slim line" and "work station" are being coined to entice the potential customer. The introduction of the latter is an answer to today's trend toward the functional rather than the conventional. "Work stations" are taking the place of the ordinary desk, such work stations being tailored to the individual, giving him a feeling of prestige and individuality. One steel furniture executive has reported that a properly planned work station for each of the 21,000,000 clerical, technical, professional and salesworkers in the United States could increase the net profit of American business by $1,500,000,000 annually. He stated that over a ten year period an employer can realize a 250 per cent return on his investment in a properly planned work station.

Steel furniture makers design their work stations to reduce the number of times the worker must leave his desk area. Once the company determines the frequency with which an employee uses certain specific items, the drawers containing those items are placed in the position easiest to reach. Additional storage or file space is available through connecting modular equipment so that every item the worker needs is within comfortable reach.

In an attempt to keep up with the latest in modular planning, several steel furniture manufacturers are introducing new styles designed and manufactured to provide the office with a large degree of flexibility in arrangement. Changing business requirements and new office procedures can, and often do, make old layouts obsolete. The problem calls for office equipment that is completely adaptable, interchangeable, and easily and quickly rearranged. Steel modular components, by providing a wide range of prefabricated elements, can give freedom of design in an office that fits today's needs perfectly.

Like steel, aluminum, the new contender in the metal office furniture field features durability, but durability in metal furniture is taken for granted. No longer a factor to be considered in the purchase of metal furnishings, durability is the natural thing to be ex-

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Efficiency and comfort were main objectives in the planning and installation of this general office area

New developments in office furnishings

THE EMPHASIS in the modern office of today on work flow and systems has greatly influenced the design of the physical office.

Today's work procedures require fiexible arrangements to meet the changes which will come about, so that the physical layout of an office must be efficiently planned and designed to be compatible with the work flow it houses.

The well planned office not only contributes to the efficiency of the work flow, it also has an important bearing on employee morale and attitudes.

An office incorporating the newest innovations in lighting, accoustics, air conditioning and other physical attributes can provide a far more stimulating and psychologically beneficial atmosphere in which to work than an office which does not have these latest innovations.

Several trends which reflect the need for flexibility and physical and psychological comfort are very much in evidence.

Modular furniture continues to be extremely popular, especially among large corporations. Folding furniture is also being looked upon with greater favor in these days of rising floor space costs because it is another means of achieving more flexibility by permitting office space to be used for several different purposes.

While steel furniture is still being used in most general office areas, wood furniture is growing in popularity for executive offices and conference rooms. A more detailed discussion of wood and steel furniture is found elsewhere in this issue.

To make flexible furniture arrangements possible, lighting, ventilation and power arrangements have been designed so that they may be spaced at frequent intervals on a modular basis.

Large light sources, including luminous ceilings in which panels of translucent materials are suspended below fluorescent light fixtures, are still popular. If these panels are set up close enough, they allow for partitions to be set up anywhere in the office without cutting off light.

Movable partitions also increase the variations possible within a set office space. Their primary purpose, whether they be of the free-standing type or the type that is bolted to floor, ceiling or other object, is, of course, to subdivide the office into various units.

Another important factor in office

design today is "sound conditioning." Various means which can be used to achieve good acoustical effects are possible, including treatment of walls and ceilings with special tiles, sprays or plasters which have acoustical properties.

The tiles come in an extensive choice of patterns and materials, and floor tiles are also available in a wide choice to further aid in the decor of the office. Many floor coverings such as carpeting and many tiles may be used to help deaden noise as well as providing serviceable floor protection.

It is rare today to see a new office building that does not have air conditioning facilities, because air conditioning has almost come to be regarded as a necessity in the modern office. Enough power outlets must be provided at regularly spaced intervals so that the supply of air ventilation or conditioning will be spread evenly.

If with careful planning one makes the best use of the equipment that can be had for the improvement of the physical office, higher employee morale as well as higher degree of productivity will be attained.

The Manufacturers

The lists below include the principal manufacturers of office desks and chairs, acoustical materials, air conditioning equipment, floor coverings, lighting fixtures and movable partitions.

Office Desks and Chairs

The following list includes the principal manufacturers of office desks and chairs. The codes used to indicate the types of products offered are as follows:

CM—Metal chairs.
CMP—Metal chairs, posture type.
CW—Wood chairs, posture type.
DM—Metal desks, standard.
DMM—Metal desks, modular.
DM—Wood desks, standard.
DWM—Wood desks, modular.
MI—Miscellaneous.
NI—No information available at press time on current products.

The Acorn Co., 4605 W. 21 St., Chicago 50. (DM)

Adjusto Equipment Co., 515 Conneaut St., Bowling Green, Ohio. (CM)

All-Steel Equipment Inc., 100 Griffith Ave., Aurora, Ill. (CM; CMP; DM; DMM)

Alma Desk Co., Drawer 271, High Point, N. C. (DW; DWM)

Alvin Industries, 14-104 Merchandise Mart, Chicago. (CM)

Arnot-Jamestown Div., Aetna Steel Products Corp., Jamestown, N. Y. (DM; DMM; DW; DWM)

Art Metal Construction Co., Jones & Gifford Aves., Jamestown, N. Y. (CM; CMP; DM)

Art Steel Co., Inc., 170 W. 233 St., New York 63. (CM; CMP; DM; DMM)

Automatic File & Index Co., 549 W. Washington Blvd., Chicago 6. (DM)

Badger, Inc., King at Front St., La Crosse, Wis. (CM; CMP)

Barcalo Mfg. Co., 166 Chandler St., Buffalo 7, N. Y. (CW)

Barler Metal Products, Inc., 214 W. Jefferson St., Goshen, Ind. (DM)

BELA Div., J & J Tool Machine Co., 9505 S. Prairie Ave., Chicago 28. (MI-Folding chairs)

Bentson Mfg. Co., Aurora, Ill. (DM; DMM)

Berger Mfg. Div., Republic Steel Corp., 1038 Belden Ave., N.E., Canton 5, Ohio. (DM)

Blair Aluminum Furniture Co., Inc., P.O. Box 31, Marietta, Ga. (CM; CMP)

Boling Chair Co., Silver City, N. C. (CW; CWP)

Brewer-Titchener Corp., Cortland, N. Y. (MI-Folding chairs)

Brown-Morse Co., Muskegon, Mich. (CM; CMP; DM; DMM)

The Brunswick-Balke-Collender Co., 623 So. Wabash Ave., Chicago 5. (CCM; DM; DMM)

The Buckstaff Co., 1127 S. Main St., Oshkosh, Wis. (CW)

Carlton-Surrey, Inc., 2202 Newark St., Grand Rapids, Mich. (CW; DW; DWM)

Central Desk Mfg. Co., 454 N. Armour St., Chicago 22. (DW; DWM)

Challenger Steel Products Corp., 350 Morgan Ave., Brooklyn 5, N. Y. (DM)

Clarin Mfg. Co., 4640 W. Harrison St., Chicago 44. (CM-Including folding chairs)

Clark & Gibby, Inc., 8 W. 40 St., New York 18. (CM; CMP; CW; CWP; DM; DMM; DW; DWM)

Cole Steel Equipment Co., Inc., 415 Madison Ave., New York 17. (CM; CMP; DM; DMM)

Columbia Steel Equipment Co., Fort Washington, Pa. (DM; DMM)

Corry-Jamestown Mfg. Corp., Corry, Pa. (DM; DMM)

Cramer Posture Chair Co., 625 Adams St., Kansas City 6, Mo. (CM; CMP; DMM)

D & J Office Furniture Co., 61 W. Hubbard St., Chicago 10. (DM; DW; DWM)

Davidson Corp., 29 Ryerson St., Brooklyn 5, N. Y. (CMP)

Dependable Mfg. Co., 2407 Fort

Vinyl-asbestos floor tile, use of partitions and spacious work arrangements reflect the planning that went into this office arrangement

This pleasant, well-lighted office with large-light areas was transformed from rough loft space

Crook Rd., Bellevue, Neb. (CM; CMP)

Designcraft Metal Mfg. Corp., 155 27 St., Brooklyn 32, N. Y. (DM; DMM)

Desks of America, Inc., P.O. Box 6185, Bridgeport 6, Conn. (CMP; DW; DWM)

Dixie Chrome Products, 711 E. First St., Irving, Tex. (CM; CMP; DM)

Domore Chair Co., Inc., 2400 Sterling Ave., Elkhart, Ind., (CM; CMP)

Dorset Steel Equipment Co., 2514 W. Dauphin St., Philadelphia 32. (DM; DMM)

Doten-Dunton Desk Co., 26 Otis St., East Cambridge 4, Mass. (CW; DW; DWM)

Dunbar Furniture Corp. of Indiana, Berne, Ind. (CW; CWP; DW; DWM)

Durable Metal Products Co., 38-42 Review Ave., Long Island City, N. Y. (DM)

Emeco Corp., Maple Ave., & High St., Hanover, Pa. (CM; CMP: CW)

Executive Furniture Co., 2800 Virginia St., Wichita Falls, Tex. (DW; DWM)

The Feldman Cowan Co., 1650 Long Beach Ave., Los Angeles 21. (CW; DWM)

The Fritz-Cross Co., St. Cloud, Minn. (CM; CMP)

Garrett Tubular Products, Inc., P.O. Box 237, Garrett, Ind. (CMP)

The General Fireproofing Co., 413 Dennick Ave., Youngstown, Ohio. (CM; CMP; DM; DMM)

The Globe-Wernicke Co., Cincinnati 12. (CM; CMP; DM; DMM)

Grand Rapids Leather Furniture Co., Inc., 201 Front St., N.W., Grand Rapids, Mich. (CW; CWP; DW)

W. H. Gunlocke Chair Co., Wayland, N. Y. (CW;CWP)

The H-O-N Co., Third & Oak Sts., Muscatine, Iowa. (DMM)

Hamilton Cosco, Inc., 2525 State St., Columbus, Ind. (CM; CMP)

Harrison Steel Desk & File Co., 4718 W. Fifth Ave., Chicago 44. (DM)

The Harter Corp., 80 Prairie Ave., Sturgis, Mich. (CM; CMP)

Haskell, Inc., 303 E. Carson St., Pittsburgh 19. (DM; DMM)

Hillside Metal Products Co., 262 Passaic St., Newark 4, N. J. (DM; DMM)

Howe Folding Furniture Co., 1 Park Ave., New York 16. (MI-Folding furniture)

Huntington Chair Corp., 20 St. & Second Ave., Huntington 18, W. Va. (CW; DW)

Imperial Desk Co., 1312 W. Florida St., Evansville 7, Ind. (CW; CWP; DW; DWM)

Indiana Chair Co., 13 & Vine, Jasper, Ind. (CW; CWP)

Indiana Desk Co., Inc., Jasper, Ind. (DW; DWM)

Invincible Metal Furniture Co., 842 S. 26 St., Manitowoc, Wis. (CM; CMP; DM; DMM)

Jasper Chair Co., Jasper, Ind. (CW; CWP)

The Jasper Desk Co., Jasper, Ind. (DW; DWM)

Jasper Office Furniture Co., 13 & Vine Sts., Jasper, Ind. (DW; DWM)

Jasper Seating Co., Inc., Jasper, Ind. (CW; CWP)

Javem Sales Corp., 31 Coffey St., Brooklyn 31, N. Y. (CM; CW; DW)

The Johnson Chair Co., 7109 Merchandise Mart, Chicago 54. (CW; CWP)

The Kenwood Corp., 2412 Pennsylvania Ave., N.W., Washington 7, D. C. (DW)

King Posture Chair Co., 953 S. Ray-

mond Ave., Pasadena 2, Calif. (C; CP)

Knoll Associates, Inc., 575 Madison Ave., New York. (CM; CW; DM; DW)

Korda Industries, 20 W. 46 St., New York 19. (DM)

Lehigh Desk Co., 106 Duane St., New York. (DW)

Lehigh Furniture Corp., 16 E. 53 St., New York 22. (CMP; CW; CWP; DW; DWM)

The Leopold Co., 914 Osborn St., Burlington, Iowa. (DW)

Macey-Fowler, Inc., 305 E. 63 St., New York 21. (CM; CMP; CW; CWP; DM; DMM; DW; DWM)

The B. L. Marble Chair Co., 89 Willis St., Bedford, Ohio. (CW; CWP)

Marnay Sales Div., Rockaway Metal Products Corp., 1270 Broadway, New York 1. (DMM)

Herman Miller Furniture Co., Zeeland, Mich. (CW; CWP; DW; DWM)

Milwaukee Chair Co., 3022 W. Center St., Milwaukee 45. (CW; CWP)

Milwaukee Metal Furniture Co., 101 N. Campbell Ave., Chicago 12. (CM; CMP)

Modern Steelcraft, Inc., 230 Fifth Ave., New York. (DM)

Monarch Furniture Co., Inc., 803-807 Ward St., High Point, N. C. (CW; CWP)

Morval Corp., Herkimer, N. Y. (CW; DW)

The Mosler Safe Co., 320 Fifth Ave., New York. (DMM)

Murphy Chair Co., Inc., 931 Wing Ave., Owensboro, Ky. (CW; CWP)

Murphy-Miller, Inc., Box 516, Owensboro, Ky. (CW; CWP; DWM)

Ray Myer Corp., Endicott, N. Y. (DMM)

Myrtle Desk Co., P.O. Box 1750, High Point, N. C. (DW)

Niagara Therapy Mfg. Corp., Adamsville, Pa. (C-With massage unit)

Norcor Mfg. Co., Inc., 666 Lake Shore Drive, Chicago. (CM)

Norquist Products, Inc., 415 Chandler St., Jamestown, N. Y. (CM; CW)

Northwest Metal Products Co., 1337 E. Mason St., Green Bay, Wis. (CM; CMP; DM)

Ohio Chair Co., Inc., 408 N. Meridian Rd., Youngstown, Ohio. (CM; CMP)

Old Hickory Furniture Co., Martinsville, Ind. (CW; DW)

Orna-metal, Inc., 2412 S. Seventh St., St. Louis 4. (DM; DMM)

Peerless Steel Equipment Co., 6600 Hasbrook Ave., Philadelphia 11. (M; CMP; DM; DMM)

Precision Mfg. Co., 831 Chicago Ave., Evanston, Ill. (CM; CMP)

Precision Metal Workers Corp., 3100 W. Carroll Ave., Chicago 41. (CM; CMP)

Remington Rand, Div. of Sperry-Rand Corp., 315 Fourth Ave., New York 10. (CM; CMP; CW; CWP; DM; DMM)

J. K. Rishel Furniture Co., 1201 W. Third St., Williamsport 19, Pa. (DW; DWM)

Riteform Chair Co., Inc., 301 Oak St., Quincy, Ill. (CM; CMP)

Rockwell-Barnes Co., 35 E. Wacker Drive, Chicago 2. (DM)

Royal Metal Mfg. Co., 1 Park Ave., New York 16. (CM; CMP)

H. Sacks & Sons, 425 E. 53 St., New York (DW)

Frank Scerbo & Sons, Inc., 140 Plymouth St., Brooklyn, N. Y. (CW; CWP; DW; DWM)

Security Steel Equipment Corp., Avenel, N. J. (DM; DMM)

The Shaw-Walker Co., Muskegon, Mich. (CM; CMP; DM; DMM)

Shelbyville Desk Co., 403 S. Noble St., Shelbyville, Ind. (DW; DWM)

The Sikes Co., Inc., 20 Churchill St., Buffalo 7, N. Y. (CW; CWP)

Standard Furniture Co., S. Washington St., Herkimer, N. Y. (CM; CMP; CW; CWP; DMM; DW; DWM)

Standard Pressed Steel Co., Box 501, Jenkinstown, Pa. (CM; CMP; DM; DMM)

Stanley Mfg. Co., 2310 N. Main St., Fort Worth 6, Tex. (CW; CWP)

Steel Furniture Mfg. Co., 15531 Arrow Highway, Baldwin Park, Calif. (DM: DMM)

Steelcase, Inc., 1491 Division Ave., S., Grand Rapids 2, Mich. (CM; CMP; DM; DMM)

Stewart Office Furniture Co., 6520 N. Hoyne Ave., Chicago 45. (DW)

Stow & Davis Furniture Co., 23 Summer Ave., N.W., Grand Rapids 2, Mich. (CW; CWP; DW; DWM)

The Sturgis Posture Chair Co., 154 E. Erie St., Chicago 11. (CM; CMP)

Stylex Seating Co., 911 Walnut St., Philadelphia. (CM; CMP)

Tab Products Co., 995 Market St., San Francisco 3. (CMP)

The Taylor Chair Co., Bedford, Ohio. (CW; CWP)

Thomas Furniture Co., 420 Manning St., High Point, N. C. (CW)

The Toledo Metal Furniture Co., 1100 Hastings St., Toledo 7. (CM; CMP)

Tower Suites, Inc., 21 W. Illinois St., Chicago 10. (CW; DW)

U. S. Chaircraft Mfg. Corp., 225 Belleville Ave., Blomfield, N. J. (CM)

The Victor Safe & Equipment Co., Inc., 315 Fourth Ave., New York 10. (DM)

Wassell Organization, Inc., Sylvan Ave., Westport, Conn. (CMP)

Welch Industries, 8557 San Fernando Rd., Sun Valley, Calif. (CMP)

Wells Chair Corp., P.O. Box 230. Michigan City, Ind. (CM; CMP)

Western Mfg. Co., 532 N. Highland Ave., Aurora, Ill. (DM)

The Worden Co., 200 E. 17 St., Holland, Mich. (CW; CWP; DW; DWM)

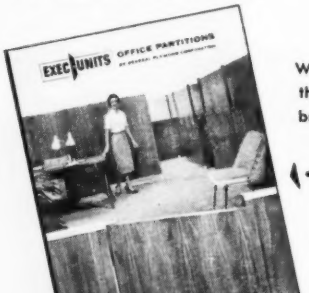
The Wright Line, 160 Gold Star

Acoustical panels give "sound conditioning" to this work space which makes use of file cabinets as office dividers

STRONG! Pound for pound stronger than steel, Exec-Units are constructed on rugged aircraft stressed-skin principle. FLEXIBLE! Unique construction and assembly principle provides modular panels that can be reduced in width.

Exec-Units are lighter than aluminum and install quickly with conventional tools. They'll last a lifetime under busy office conditions.

In glowing natural walnut or your choice of decorator colors. Choose from three basic styles: low rail, glazed rail, flush screen. Regroup easily when you expand your office. All materials are reusable.



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EXEC-UNITS DIVISION, O.M.
GENERAL PLYWOOD CORP.
P.O. BOX 1403, LOUISVILLE, KENTUCKY

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Blvd., Worcester 6, Mass. (CMP)

Yawman & Erbe Mfg. Co., 1099 Jay St., Rochester 3, N. Y. (DM; DMM)

Acoustical Materials

The following list of manufacturers indicates the principal makers of acoustical products used in offices.

The following codes are used:

B—Acoustical baffles such as may be used with luminous ceilings.

H—Hoods and cabinets used to enclose office machines.

MI—Miscellaneous.

NI—No information available at press time on current products.

PS—Acoustical plasters and sprays.

SC—Suspended ceilings-i.e. grids and other structures used to support tiles, lighting fixtures, etc.

TC—Ceiling tiles and panels.

TW—Wall tiles and panels.

Accesso Systems, Inc., 4615 Eighth Ave., N.W., Seattle 7. (SC-NI)

Armstrong Cork Co., 1010 Concord, Lancaster, Pa. (TC; TW)

Benjamin Electric Mfg. Co., Des Plaines, Ill. (B-NI)

Burgess-Manning Co., 5970 Northwest Highway, Chicago 31. (H-NI; SC-NI)

The Celotex Corp., 120 S. La Salle St., Chicago 3. (TC)

Cupples Products Corp., 2650 S. Hanley Rd., St. Louis. (SC-NI)

Eagle Ottawa Leather Co., P.O. Box 308, Grand Haven, Mich. (TW)

The Flintkote Co., 30 Rockefeller Plaza, New York 20. (TC-NI)

GR Products, Inc., 2417 Eastern Ave., S.E. Grand Rapids, Mich. (MI-Acoustical movable partitions and walls)

Gates Acoustinet Co., 529 American Standard Bldg., Buffalo 7, N. Y. (H)

The Goodyear Tire & Rubber Co., 1144 E. Market St., Akron 16, Ohio. (TW)

Johns-Manville, 22 E. 40 St., New York 6. (TC)

Kaiser Gypsum Co., Inc., St. Helens, Ore. (MI-Insulating plank-NI; TC-NI; TW-NI)

Keasbey & Mattison Co., 1955 Butler Ave., Ambler, Pa. (PS-NI)

Lahabralite Co., 1631 W. Lincoln, P.O. Box 2005, Anaheim, Calif. (PS)

Luminous Ceilings, Inc., 2500 W. North Ave., Chicago 47. (B; SC)

Marsh Wall Products, Inc., Dover, Ohio. (TW)

Mastic Tile Corp. of America, Newburgh, N. Y. (TW-NI)

Mid West Noise Control Co., 6265 Carrolton, Indianapolis. (B-NI)

Minnesota & Ontario Paper Co., Insulite Div., Baker Arcade Bldg., Minneapolis, Minn. (TC)

National Gypsum Co., 325 Delaware Ave., Buffalo 2, N. Y. (TC;TW)

New England Lime Co., Nelco Acoustical Tile Div., Adams, Mass. (TC-NI; TW-NI)

Owens-Corning Fiberglas Corp., National Bank Bldg., Toledo 1, Ohio. (B; TC; TW)

F. E. Schundler & Co., Inc., 504 Railroad St., Joliet, Ill. (PS; TC)

Simpson Logging Co., Shelton, Wash. (MI-Metal acoustical units, perforated cement asbestos and hardboard; TC; TW)

Steel Partitions, Inc., P.O. Box 807, Jamestown, N. Y. (TW-NI)

Sylvania Electric Products Inc., 1470 Broadway, N. Y. (B-NI)

Tectum Corp., 105 S. Sixth St., Newark, Ohio. (TC)

U. S. Gypsum Co., 300 W. Adams St., Chicago 6. (MI-Sheetrock wallboard and woodgrained sheetrock; TC)

The Upson Co., Lockport, N. Y. (TW)

The Wakefield Co., 731 S. Water St., Vermilion, Ohio. (B; SC)

Watkins Industries, P.O. Box 2621, Youngstown, Ohio. (H)

Wood Conversion Co., First National Bank, St. Paul 1, Minn. (TC)

Zonolite Co., 135 S. LaSalle St., Chicago 3. (PS)

Air Conditioning

The codes used in this list are as follows:

BWA—"Built-in-wall" air conditioners, air cooled.

C—Equipment for use with centralized air conditioning systems.

D—Dehumidifiers.

F—Fans and air circulators.

H—Humidifiers.

MI—Miscellaneous.

NI—No information available at press time on current products.

PA—"Packaged" air conditioners larger than room size, air cooled.

PW—"Packaged" air conditioners larger than room size, water cooled.

RCA—Room size console air conditioners, air cooled.

RCW—Room size console air conditioners, water cooled.

WA—Window type air conditioners, air cooled.

Abbeon Supply Co., 179-15 Jamaica Ave., Jamaica 32, N. Y. (D; H)

Admiral Corp., 3800 Cortland St., Chicago 47. (BWA; D; PA; WA)

Air Controls, Inc., Div. of The Cleveland Heater Co., 2310 Superior Ave., Cleveland 14. (F)

Amana Refrigeration, Inc., Amana, Iowa. (BWA; C; WA)

American Blower Corp., Div. of American-Standard, Detroit 32. (C; D; F; PA; PW)

American Motors Corp., Kelvinator Div., 14250 Plymouth Rd., Detroit 32. (BWA; D; WA)

Amic Mfg. Corp., 21-24 44 Ave., Long Island City 1, N. Y. (BWA; WA)

Argus Mfg. Co., 1134 N. Kilbourn Ave., Chicago 51. (F)

Bar-Brook Mfg. Co., 6133 Linwood Ave., Shreveport, La. (F)

Bryant Mfg. Co., 2020 Montcalm St., Indianapolis 7. (PA; PW)

Carrier Corp., 300 S. Geddes St., Syracuse 1, N. Y. (BWA; C; PA; PW; RCA; WA)

Chelsea Fan & Blower Co., Inc., 639 South Ave., Plainfield, N. J. (F)

Chrysler Corp., Airtemp Div., 1600 Webster St., Dayton 4, Ohio. (BWA; PA; PW; WA)

Circle-Air Industries, 244 Herkimer St., Brooklyn 16, N. Y. (C-NI)

The Coleman Co., Inc., 250 N. St. Francis St., Wichita, Kans. (PW)

Commander Mfg. Co., 4225 W. Kinzie St., Chicago (F)

Cory Corp., Fresh'nd-Aire Div., 3200 W. Peterson Ave., Chicago 45. (F; D; H; WA)

Crosley Div., Avco Mfg. Co., 1329 Arlington Ave., Cincinnati. (WA-NI)

Curtis Mfg. Co., 1905 Kienlen Ave., St. Louis 20. (PA; PW; RCW)

Daffin Mfg. Co., Lancaster, Pa. (H-NI)

Dayton Electric Mfg. Co., 126 S. Oakley Blvd., Chicago 12. (F)

The Deering Air Conditioning Co., 1069 Celestial St., Cincinnati. (BWA; WA)

Diehl Mfg. Co., Finderne Ave., Somerville, N. J. (F)

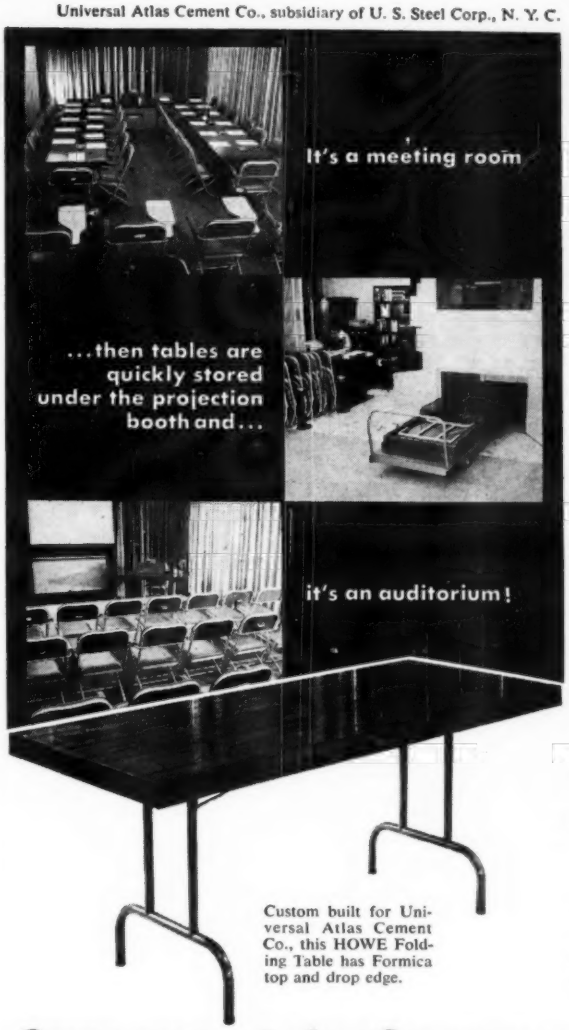
Drayer-Hanson, Inc., 3301 Medford St., Los Angeles 63. (BWA; PW; RCA; RCW; WA)

Dryomatic Corp., P.O. Box 334, Alexandria, Va. (D)

The Ebco Mfg. Co., 265 N. Hamilton Rd., Columbus 13, Ohio. (D)

The Emerson Electric Mfg. Co., 8100 Florissant Ave., St. Louis 21. (BWA; D; F; MI-Portable model; WA)

Universal Atlas Cement Co., subsidiary of U. S. Steel Corp., N. Y. C.



Custom built for Universal Atlas Cement Co., this HOWE Folding Table has Formica top and drop edge.

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Multi-purpose use of valuable floor space at Universal Atlas Cement Co. "decreases space costs, increases space usage, improves general operating efficiency." So finds Alwyn W. Ogden, Office Manager

HOWE Folding Tables are an important part of Universal Atlas' Multi-purpose room set-up. Handsome HOWE Folding Tables fold and unfold in seconds, can be handled by one man.

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American Enka Corp.
American Management Assoc.
Bankers Trust Co.
B.O.A.C.
Boeing Aircraft
Carpenter Steel Co.
Cities Service Oil Co.
Continental Baking Company
E. I. du Pont de Nemours & Company
General Electric Co.
Hearthstone Insurance Company
Haynes Stellite Co., Div. of Union Carbide Corporation
International Business Machines Corp.
Johnson & Johnson
Libby McNeill & Libby
Metropolitan Life Insurance Co.
National Biscuit Co.
New Jersey Bell Telephone
New York City Housing Authority
New York City Transit Authority
Reynolds Tobacco Co.
Schering Corporation
Seagram Distillers Corporation
Singer Sewing Machine Company
Socony Mobil Oil Co.
Standard Oil of New Jersey
Standard Vacuum Oil Company
Union Carbide Corp.
United States Government
United States Steel Corporation
Universal Atlas Cement Co., Subsidiary of U. S. Steel Corp.
Western Electric Co.

If it folds — ask HOWE!

Emerson Radio & Phonograph Corp., 14 & Coles Sts., Jersey City 2, N. J. (BWA; MI- Portable model; PW; WA)

Fasco Industries, Inc., Davis & Toppin Sts., Rochester 2, N. Y. (F)

Fedders-Quigan Corp., 5801 Grand Ave., Maspeth 78, N. Y. (BWA; D; PA; PW; WA)

Friedrich Refrigerators, Inc., 1117 E. Commerce St., San Antonio 3, Tex. (PA; PW; WA)

Frigid, Inc., 128-168 32 St., Brooklyn 32, N. Y. (D; F; WA)

General Electric Co., Air Conditioning Div., 5 Lawrence St., Bloomfield, N. J. (C; PA; PW; WA)

General Motors Corp., Frigidaire Div., 300 Taylor St., Dayton 1, Ohio. (BWA; PW; WA)

Gibson Refrigerator Co., Div. of Hupp Corp., Greenville, Mich. (D; PA; WA)

The A. C. Gilbert Co., Erector Square, New Haven 6, Conn. (F)

Goodwill Mfg. Co., 1215 S. 52 Ave., Cicero 50, Ill. (F-NI)

Hunter Fan & Ventilating Co., Inc., 400 S. Front St., Memphis 2, Tenn. (F; WA-NI)

I. W. Air Conditioning Corp., Div. of I. W. Wenig & Sons, Inc., 230 Manida St., New York 59. (BWA; MI-Portable model)

Ilg Electric Ventilating Co., 2850 N. Pulaski Rd., Chicago 41. (F; MI-Cabinet-type air conditioner; PA; WA)

Kisco Co., Inc., 2400-40 Dekalb St., St. Louis 4. (F)

Lasko Metal Products, West Chester, Pa. (F-NI)

The Lau Blower Co., 2027 Home Ave., Dayton 7, Ohio. (F)

LeJohn Mfg. Co., 111 22 St., Huntington, W. Va. (F-NI)

Lewyt Mfg. Corp., 43-22 Queens St., Long Island City, N. Y. (BWA)

Manning-Bowman Div., McGraw Electric Co., Elgin, Ill. (F)

Mitchell Mfg. Co., Div. of Cory Corp., 3200 W. Peterson Ave., Chicago 45. (BWA; C; D; MI-Portable model; PA; PW; WA)

Perfection Industries, Div. of Hupp Corp., 7609 Platt Ave., Cleveland 4. (C)

Philco Corp., Tioga & C Sts., Philadelphia 34. (BWA PA; RCA; WA)

Radex Corp., 2076 Elston Ave., Chicago 14. (MI-Air cleaners)

Reed-Unit Fans, Inc., 1001 St. Charles Ave., New Orleans. (F-NI)

Remington Corp., 171 Wiley St., Auburn, N. Y. (C; D; RCA; RCW; WA)

Rheem Mfg. Co., 7600 S. Kedzie Ave., Chicago 29. (C; WA)

Phil Rich Fan Mfg. Co., Inc., 2900 Caroline St., Houston 4. (F)

Robbins & Myers, Inc., Hunter Div., 2500 Frisco Ave., Memphis, Tenn. (F)

Seabreeze-America Ltd., 701 Seneca St., Buffalo, N. Y. (F-NI)

Servel, Inc., 119 N. Morton Ave., Evansville 20, Ind. (C-NI)

Shana Mfg. Co., 188 W. Randolph St., Chicago 1. (PA-NI; PW-NI)

Signal Electric Div., King-Seeley Corp., 1823 Thirteenth St., Menominee, Mich. (F)

Spitzka Mfg. Co., 235 Colfax St., No. Sacramento, Calif. (MI-Portable evaporative coolers)

The Stratfield Co., 434 Grand St., Bridgeport, Conn. (F)

Superior Electric Products Corp., Box 426, Cape Girardeau, Mo. (F)

The O. A. Sutton Corp., 1812 W. Second St., Wichita, Kans. (BWA; C; F; PA; WA)

The Trane Co., Second & Cameron Aves., La Crosse, Wis. (C; F; PA; PF; RCA; RCW)

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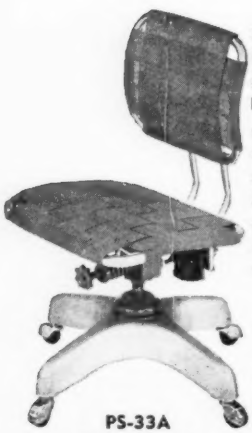

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Typhoon Air Conditioning Co., 505 Carroll St., Brooklyn 15, N. Y. (BWA; PA; PW)

Union Asbestos & Rubber Co., 332 S. Michigan Ave., Chicago. (C-NI; PA-NI; PW-NI)

United States Air Conditioning Corp., 7900 Tabor Rd., Philadelphia 11. (PA; PW)

Victor Electric Products, Inc., 2950 Robertson Rd., Cincinnati 9. (F-NI)

Viking Air Products, 5601 Walworth Ave., Cleveland 2. (F)

Walton Laboratories, Inc., 1186 Grove St., Irvington, N. J. (H)

Welbilt Corp., 57-18 Flushing Ave., Maspeth 78, N. Y. (BWA; WA)

W. W. Welch Co., 1010 Enquirer Bldg., Cincinnati 2. (F)

Westinghouse Electric Corp., 3 Gateway Center, Pittsburgh. (F; PA; WA)

Whirlpool Corp., St. Joseph, Mich. (BWA; C; D; WA)

Wilster, Inc., 5700 Detroit Ave., Cleveland 2. (F-NI)

Worthington Corp., Harrison, N. J. (PA; PW)

York Corp., York, Pa. (BWA; C; PA; PW; RCA; WA)

Floor Coverings

This list includes manufacturers of carpeting, linoleum, tiles of various types, and similar materials. The following codes are used to indicate the types of products made by each manufacturer:

C—Carpeting, materials either not specified or as indicated.

CA—Carpeting, Acrilan.

CC—Carpeting, cotton.

CN—Carpeting, nylon.

CR—Carpeting, rayon.

CW—Carpeting, wool.

L—Linoleum, roll form.

MI—Miscellaneous.

MR—Matting, rubber.

NI—No information on current products available at press time.

T—Tiles, materials either not specified or as indicated.

TA—Tiles, asphalt.

TC—Tiles, cork.

TL—Tiles, linoleum.

TR—Tiles, rubber.

TV—Tiles, solid vinyl.

TVA—Tiles, vinyl asbestos.

TVP—Tiles, vinyl plastic.

Ace Lite Step Co., 1798 S. State St., Chicago 16. (MR-NI; TR-NI)

Ace Rubber Products, Inc., 100 Beech St., Akron, Ohio. (MI-NI; MR-NI)

Aldon Rug Mills, Leni Mills, Pa. (C-NI)

American Biltrite Rubber Co., Inc., Foot of Perrine Ave., Trenton 2, N. J. (MI-Rubber carpeting; MR; TR; TV)

Armstrong Cork Co., Lancaster, Pa. (C-Deltox; L; MR; TA; TC; TL; TR; TV; TVA)

Artloom Carpet Co., Inc., Allegheny Ave. & Howard St., Philadelphia 33. (CA; CN; CR; CW)

Bigelow-Sanford Carpet Co., Inc., 140 Madison Ave., New York 16. (C-NI)

Bird & Son, Inc., East Walpole, Mass. (L; MI-Vinyl sheet goods; TL)

Bonafide Mills, Inc., 295 Fifth Ave., New York. (L; MI-Vinyl plastic rolls; TA; TL; TV; TVA; TVP)

The Philip Carey Mfg. Co., Wayne Ave., at Cooper, Cincinnati. (TA)

Collins & Aikman Corp., 210 Madison Ave., New York. (CN-NI)

(To page 69)

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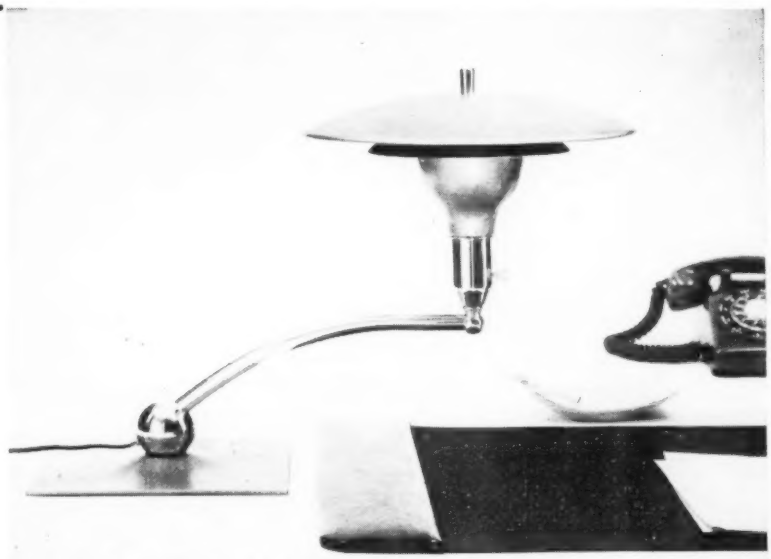

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office management

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July-December, 1958

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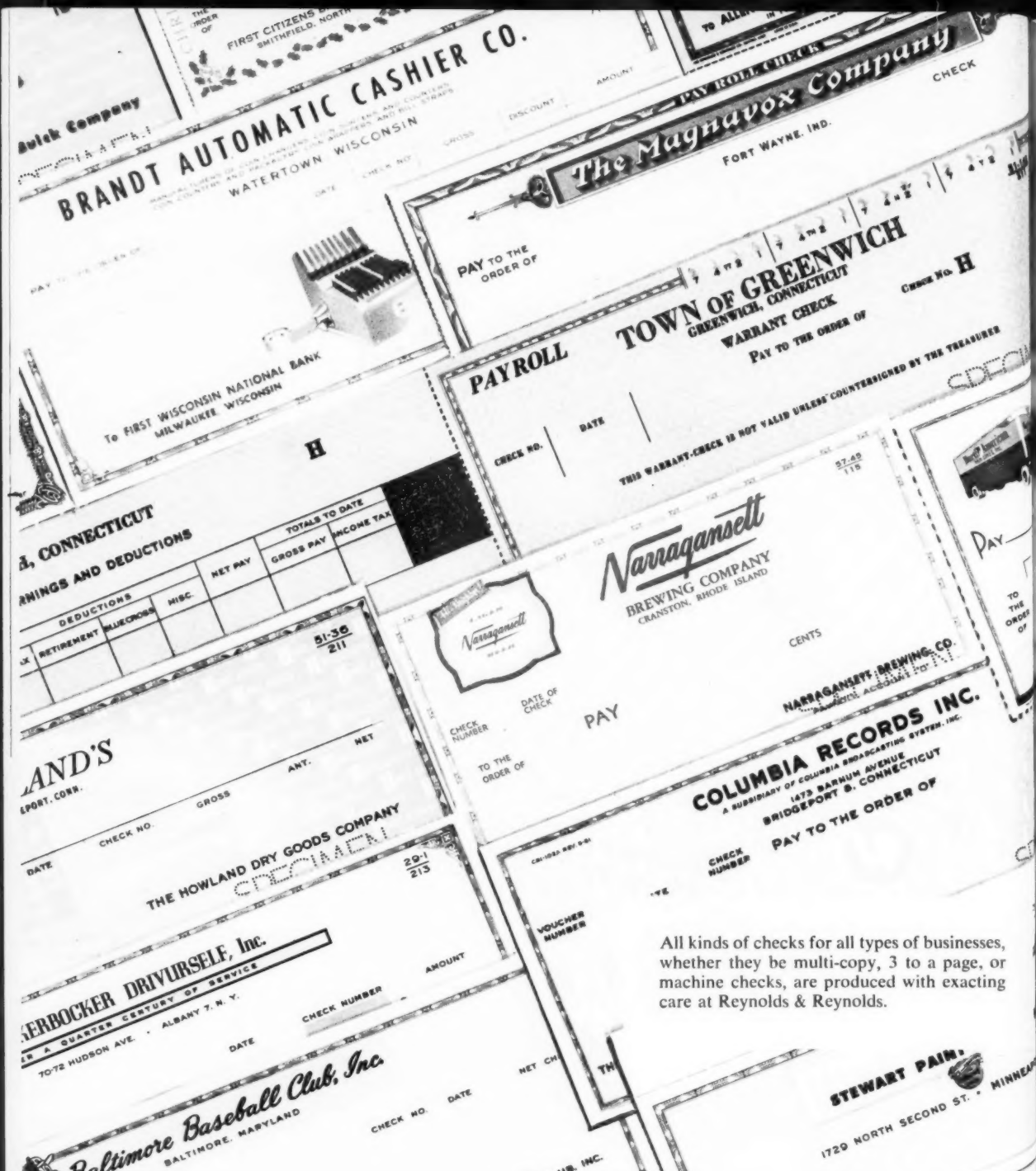

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MINNESOTA, ST. PAUL: J. K. Annett, M. Bozenich, MI 5-5525.
MISSOURI, KANSAS CITY: J. Orwig, G. Kleban, BA 1-1817; ST. LOUIS: J. L. McLeod, PA 6-1188.
NEBRASKA, OMAHA: L. L. Rentschler, AT 4616.
OHIO, AKRON: B. Given, FR 6-8621; CINCINNATI: E. VanNess, AV 1-3068; CLEVELAND: L. M. O'Connor Sr., R. E. Lee, UT 1-6525; COLUMBUS: L. M. Price, HU 8-6534; DAYTON: R. G. Butcke, N. F. Gregg, L. Hawkes, R. L. Heilig, BA 4-3831; TOLEDO: G. O. Sullivan, GR 4-5365.
WISCONSIN, MILWAUKEE: H. A. Jennrich, C. G. Langheck, BR 3-6320.

SOUTH ATLANTIC
FLORIDA, JACKSONVILLE: C. C. Hassel Jr., EV 7-1117.
GEORGIA, ATLANTA: G. H. Fowler, B. Smith, JA 2-3377.
MARYLAND, BALTIMORE: G. E. A. Stewart, ID 3-5766; SILVER SPRING: T. Wisner, JU 9-3080.
NORTH CAROLINA, CHARLOTTE: B. R. Wilson, ED 4-9425.
VIRGINIA, RICHMOND: W. G. Archer, MI 8-5625.
WEST VIRGINIA, HUNTINGTON: J. H. Holliday, JA 5-8468.

SOUTH CENTRAL
ALABAMA, BIRMINGHAM: M. H. Reisinger, FA 3-3769.
KENTUCKY, LOUISVILLE: J. B. Hughes, JU 3-6876.
LOUISIANA, NEW ORLEANS: E. M. Brooks Jr., JA 5-4513; SHREVEPORT: W. D. Martin, 65-3194.
OKLAHOMA, OKLAHOMA CITY: C. Martin, FO 5-3021; TULSA: F. Pontious, WE 9-5508.
TENNESSEE, MEMPHIS: R. G. Thompson, BR 2-2912; NASHVILLE: G. W. Sisk, AL 6-8851.
TEXAS, CORPUS CHRISTI: B. G. Helm, TU 3-5261; DALLAS: G. B. Shafer, H. W. Secker, C. Stewart, FL 7-4627; HOUSTON: G. B. Haggott, R. F. Hendrix, JA 4-2405; LUBBOCK: B. Stewart, PO 3-1261; SAN ANTONIO: W. D. Gaston, PE 2-5161.

MOUNTAIN
COLORADO, DENVER: R. J. Folkman, AC 2-5440.

PACIFIC
CALIFORNIA, LOS ANGELES: J. A. Cook, L. Despie, J. Drummond, T. Gowran, T. I. McKee, A. W. Skelton, NO 3-2251; OAKLAND: B. J. Lundquist, TE 2-7156; SACRAMENTO: D. Drake, GI 3-5019; SAN BERNARDINO: A. G. Cundiff, TU 9-3191; SAN DIEGO: J. R. Greene, CY 5-3508; SAN FRANCISCO: H. F. DuPre, KL 2-2648; SAN JOSE: B. Keagy, CY 3-1138.
OREGON, PORTLAND: A. Bouchard, CA 3-5924.
WASHINGTON, SEATTLE: W. E. Booth, MU 2-5790.

Use Readers' Inquiry Coupon on Page 188

Manufacturers' list—

(From Page 65)

Congoleum-Nairn, Inc., Gold Seal Div., 195 Belgrove Drive, Kearney, N.J. (L; MI-Vinyl sheet goods, rotogravure vinyl, enamel surface sheet goods; TA; TC; TR; TV; TVA; TVP)

Congoleum-Nairn, Inc., Sloane-Delaware Div., P.O. Box 401, Trenton, N. J. (L; MI-Felt-backed vinyl tiles; TV)

Crown Rubber Co., 1615 Croghan St., Fremont, Ohio. (C-Nylon-viscose and viscose; R-vinyl with foam rubber backing; T-Nylon-rayon impregnated rubber)

Deltox Rug Co., 35 Wisconsin St., Oshkosh, Wis. (MI-Fibre rugs)

Fibreboard Paper Products Corp., 475 Brannan St., San Francisco 19. (L; MI-Vinyl rolls; TL)

The Firth Carpet Co., 295 Fifth Ave., New York 16. (C-Blends of wool and other materials; CA; CW)

The Flintkote Co., The Tile-Tex Div., 1232 McKinley Ave., Chicago Heights, Ill. (T-industrial; T-plastic asbestos; TA; TVA)

The B. F. Goodrich Co., Flooring Products Div., Watertown 72, Mass. (MI-Rubber stair treads; TA; TR; TV; TVA)

The Goodyear Tire & Rubber Co., 1144 E. Market St., Akron 16, Ohio. (MI-Rolls of rubber and vinyl, airfoam padding for use under carpeting; TR; TV)

Hardwick & Magee Co., Inc., Seventh St., & Lehigh Ave., Philadelphia. (C-NI)

Johns-Manville, 22 E. 40 St., New York 16. (TA; TVA)

Kentile, Inc., 58 Second Ave., Brooklyn 15, N. Y. (TA; TC; TR; TV; TVA) (To Page 145)

Wood—

(From Page 55)

appeal of their products will continue to solidify their position with regard to the executive furniture market. To make up for their losses in the general office market, the wood office furniture industry is apparently planning to meet the competition on its own terms—by stressing durability, style, price, maintenance cost and fire resistance.

Steel—

(From Page 57)

pected. But aside from sturdiness, aluminum can offer a light and airy motif. Various patterns of aluminum such as rolled rib, striated grain, horizontal and vertical slot, perforated, and woven rods as well as tubing can be used in many unique ways. The metal can be combined with high-pressure laminate tops and top grain leather inserts that create various effects. Two-tone color anodizing on a production basis makes possible a range of color combinations which is practically unlimited.

In steel, as well as in wooden furniture, manufacturers are noting a gradual but steadily increasing change in the marketing procedure for office furniture. More merchandising is being done through interior decorators and architects, especially in the larger cities. In many cases, even the smallest office will have the aid of a decorator when it comes to buying furnishings. In such an instance, the small office will make use of the services offered by the decorator staff of the retail store furniture supplier rather than calling in an independent consultant. At any rate, it is the interior decorator's or architect's job not only to plan the layout of the office in question, but also to set up the source of supplies for all of the work necessary to complete an office or business installation, and see that the whole project is carried through to the finish.

Dealing with these people, steel office furniture manufacturers and suppliers report, is considerably different from dealing with the average customer, who is often confused by the great variety of styles available. With the latter, the procedure is one of introducing or changing the styles and then orienting or educating the customer in order to induce acceptance of the product. Decorators, however, need no orientation. They are well aware of the styles available, and they act as the spearhead in the demand for new variations in function and design. Steel furniture makers are responding to the wants of these people and others by adapting themselves to supply new styles. For this reason, together with the new competition from aluminum, the field of steel furnishings is going through a transitional period in an effort to keep up with the latest modern trends.

The chances are, our doctors tell us, that one in every four of your employees (whether key executives, skilled workers, experienced secretaries or valued clerks) will develop cancer at some time in their lives. What is worse, many of them may die **needlessly,** unless they know how to guard against it. To help save the lives of more of your fellow-workers, call or write our nearest office for information about a free employee education program, geared to your particular factory or office.

American Cancer Society

A review of current office equipment

TOOLS OF THE OFFICE

by Irene Lipschitz
Research Associate, *Office Management*

The problems of the office manager require a knowledge of both systems and machines

In this section:

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(See also the Office Layout and Furnishings *section, page 49, for other types of equipment.)*

THE OFFICE MANAGER of today is in a very different position from his predecessors of a half century ago. The world of commerce has changed enough and become so complex, that the knowledge required of an office administrator is almost unlimited.

He must not only be a practitioner of the office arts, he must also be a student of methods and procedures, a deviser of programs, and a coordinator of varied and sometimes conflicting systems.

Office problems are best solved by the use of the best systems which may or may not call for machines. The new machines may permit new systematization of office work but the machines are not an end in themselves.

The immense growth of technological information in the office field, knowledge of systems and of machines, makes it imperative that the office manager have time to study and plan for the best use of equipment and systems in his work.

Systems must be tailor-made to suit the individual needs of any office and cannot be purchased like machines. But machines make possible some of the systems most useful to the office manager so that a study of them can be most informative.

The pages which follow are intended to offer a general guide to some of the most important kinds of office equipment. It is hoped that the articles covering each type of equipment will provide the kind of outline that may clarify for the office manager particular areas he may wish to investigate further for greater detail. As an added help, each section contains a list of the major manufacturers of each general type of machine, together with a coded index to the type of equipment offered by each.

Even in a section as large as this it is impossible to cover the subject thoroughly. To some extent, systems uses are mentioned in connection with some of the office machines, but even where they are not the importance of systems is always an underlying thought.

It is hoped that this section will provide the office manager with enough detailed information to help him in some way accomplish the huge task his responsibilities impose upon him.

Adding, Calculating, and Accounting Machines

AMONG THE streams of information which enter the office each day, is information in the form of numbers. As with all other types of data which must be processed in the daily work routine, numbers must undergo various changes in order for action to be taken on the facts they represent. They must be sorted, combined and recombined with other figures, tabulated and summarized.

History is filled with the various ways man has sought to make his task of working with numbers easier. Our own era has seen the development of the electronic computer. This latest advance, however, has not yet replaced the traditional machines used in offices for working with numbers, and it is unlikely that it will do so in the forseeable future.

The basic work to be done in the office still remains. Prices must be totaled and have their extensions totaled. Sales figures must be classified by various topics and then combined. Discounts and payrolls, taxes and commissions as well as countless other numerical items must still be determined on-the-spot in the normal flow of work. Thus, even in the most highly automated office, adding, bookkeeping and accounting machines, systems and equipment retain their usefulness.

In spite of the efficient systems programmed into various integrated data processing units which work, according to pre-determined instructions at incredible speeds, work of a seldom-recurring or exceptional nature exists. Standard office machines continue to prove their value in these circumstances and, naturally, in the majority of offices which do not use any IDP equipment per se.

Effectiveness depends on system

The effectiveness of a machine depends more upon its ability to supply the needs of a particular system than on its own characteristics. Any machine to aid man in his calculations may fit effectively into an office's system, provided it is suited to the needs of the office in terms of its speed, ease of operation, capacity, price, maintenance, versatility and other governing factors.

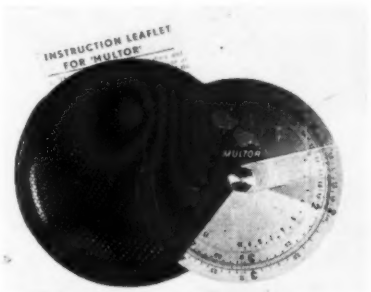
The advent of complex office equipment has replaced standard machines in those instances where the standard machines were not actually capable of performing their duties at the speeds required, but speed in itself is not always important. A machine should not be purchased just because of its speed unless the speed justifies itself by making possible timely reports that cannot otherwise be made, for example, or permits either a reduction in the labor force or useful increased production relative to labor or production costs.

An expensive computer does not justify itself in a small store totaling customer purchases, any more than a fast non-printing calculator does if the results of the calculations must be recorded manually, as can be done automatically on a printing adding machine.

Judgment of final speed of a machine must include not only how fast the machine can work with the figures, but also the arrangement of controls which determine the speed of the operator, and the convenience of using the output information. If two adjacent departments in an office must use a machine for figuring, it may be more effective for the office to be equipped with two fairly simple machines than one which may do the work of either one of them twice as fast.

It is the system of doing work which is always the paramount factor to consider. Machines help comprise the system and may, of course, improve it considerably provided that they are purchased with discrimination and with awareness of how they fit into the entire systems procedure.

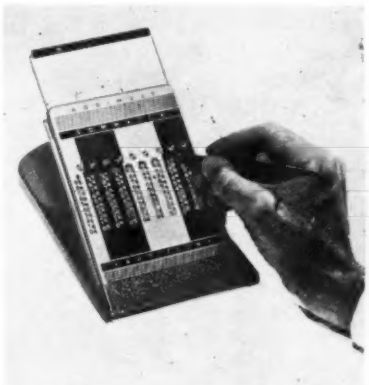
Disregarding the pencil and paper, which are the simplest aids for working with numbers, there is a wide range of many other devices for this purpose.



Pocket calculator can figure fractions in the thousandths. Pictures on page courtesy of R/B Crafters.

Some of the most elemental of these devices are simple scales, charts and tables. Several of these, like the ones designed to compute payrolls by multiplying wages by hours worked, are available in book and chart form as well as on plastic scales and slide rules. Similar devices can be created by do-it-yourself methods in the office which uses non-standard figures in some recurring operations. Scales and charts are also available for various tax and interest calculations, as well as other operations.

There are also on the market very simple machines such as miniature adding machines and calculators which can perform some fairly complicated computations. Although small enough to be carried around readily, they use mechanical gearing for purposes of addition with inputs being made through simple levers or keys, or sometimes by insertion of a stylus in a dial which resembles that of a telephone.



"Addimult Summator" is device which adds or subtracts manually up to nine columns of figures.

Because nearly all forms of computation in the office can be considered either positive or negative addition, (multiplication being repeated addition and division a form of repeated subtraction), a very simple adding device can be used for many kinds of numerical operations in the office.

The major factor distinguishing these simple devices from more complicated equipment, aside from the speed of operation, is their lack of automatic short cuts, such as provisions to eliminate the need to reenter figures in the machine repeatedly.

Standard adding machines may be electrically or manually powered. The former kind are, of course, the more expensive. Basically, there are two popu-

lar styles of standard adding machines.

The Remington Rand electric adding machine model 93 features a "handspan" keyboard engineered for touch-method operation.

The ten-key model is more adaptable to high-speed touch manipulation by its operator, while the full-keyboard model permits the user to check each number in turn on the keyboard before it is entered into the machine. Most of the ten-key machines print results on tape while most of the full-keyboard machines show their results on a dial. However, models of the two basic types are offered with either method of seeing the final tabulations. In certain cases, the machine may have a carriage to allow printing on forms but this feature usually takes the model into the bookkeeping machine class.

The calculator is a more complex form of adding machine that may be either manual or electric, ten-keyboard or full-keyboard design, or of the printing or non-printing variety. The speed of calculators over simpler add-

Addition, subtraction, multiplication and division can be done with full-keyboard machine designed by the Clary Corp.

ing machines is not too significant as truly high-speed operations come about with the use of electronic equipment. The differences lie mainly in specific keyboard arrangements and short-cut features.

In some machines the multipliers may be entered on a separate keyboard or in others a telephone-type dial may be used. And in other models, it may be more convenient to use the principle of repeated addition with the help of a repeat key.

Special features on calculating machines may include automatic positioning of decimal points, the showing of amounts entered and computed in various sets of dials, the printing of credit balances in red, the automatic rounding off of fractional values, special provision for figuring standard fractions, the figuring of square roots and computing in the binary numbering system. Some of these features may be available on smaller adding machines.

Automatic electric calculator manufactured by Marchant Calculators is marked by a "flow" system for holding intermediate answers.

Bookkeeping and accounting machines differ from adding and calculating machines in that they provide certain additional capacities such as the ability to print descriptive information in billing, to sort figures into separate registers for totaling separately, or to perform other functions that are supplementary to the figuring capacity. Regardless of how simple or complex the figuring capacity of a bookkeeping machine may be, some provision is made for the results to be printed out. The form of the printed results may sometimes take that of a "common language."

Some bookkeeping and accounting machines may be as simple as a posting machine in which a bank of date and symbol keys are used to identify items listed on statements. Some of these have little more figuring capacity than is necessary for simple horizontal addition as used in determining current balances. But bookkeeping and ac-

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counting machines may become very complex. The versatility and capacity of a machine increases with the number of registers, and the type of descriptive keyboard offered.

Each register will permit the figuring of an individual subtotal which may or may not be added automatically into grand totals. Descriptive keyboards may be as complete as a full typewriter keyboard with additional special keys.

Some machines are "programmed"

With the larger of these machines it is necessary to "program" then somehow to make proper use of their figuring and descriptive abilities so that they can follow a pre-determined routine easily. For example, it may be required to enter one figure, multiply it by another, add a third, figure a percentage of the total, and subtract the result from some previously computed balance. The series of steps that the machine will go through will fall into just a few basic categories such as addition or subtraction, multiplication or division, entering of figures, tabulating and stopping to allow entry of descriptive information from a keyboard.

The simplest machines have these steps individually supervised by an operator but the larger and more complex ones take over these steps automatically. The "programming" is done in various ways and generally, the programs are interchangeable. Changes may be made on some by easily switching a control bar, or in others by presetting several different programs in the machine and selecting the desired program by turning a knob. Of course, with electronic equipment, the possibilities are far greater.

Because of the "interchangeable function" capability of the larger machines, one unit can be used for payroll, accounts receivable, accounts payable, inventory and other uses. An example of this is one payroll model which also computes Social Security taxes automatically, excluding that portion of income which is not subject to the tax.

One of the most significant developments in adding, calculating, bookkeeping and accounting machines has been the adaptation of these machines for use in integrated data processing systems. This is usually accomplished by equipping standard machines with units for reading and/or creating a common language record which can be used by another machine. By doing this it is possible to use machines not created specifically for integrated data processing to help enter information into the system at any point so that the information may be carried to other points within the system without being re-entered by human agency.

In addition to actual machines, there are also certain types of bookkeeping and accounting systems which permit rapid handling of small-scale bookkeeping functions even though they do not provide for actual figuring.

One of the most important of these are the "one-writing" systems. The "one-writing" system revolves around the use of carbon either in spot or paper form or an equivalent method of creating more than one copy of a given entry from a single writing by use of paper treated to reproduce figures entered automatically on a second sheet.

In this system a number of related accounting forms which use certain common information are aligned in proper registration so that information written on the top form is repeated where necessary on the forms below. To avoid transfer of unwanted information, carbon is used only on those parts where transfer is required. In some cases areas may be overprinted in such a way that unwanted information if transferred is illegible.

A payroll application of a "one-writing" system would have the check or cash envelope, the journal, the employee's pay statement, and the continuous earnings record made with one writing of the appropriate information. In an accounts payable operation the purchase or cash disbursements journal, check and ledger can be prepared simultaneously, or in an accounts receivable operation, the statement, ledger card and journal may be written at once. Other applications are, of course, possible provided that the suitable forms are created.

Different arrangements available

One of the common adjuncts of "one-writing" systems is the pegboard. This consists basically of a flat writing surface which has been equipped with pegs or other means for holding forms in registration. The pegboard usually features some mechanical device for advancing one set of forms and bringing a new set into position on completion of each set. This can be achieved by a ratchet and lever system. Sometimes the board is actually a box with a roller system for mounting and advancing one or more of the forms after use.

Board-mounting is just one way of arranging "one-writing" systems. Some systems use forms in a binder while in others the forms may be held in registration for typing on a systems typewriter. Such typewriters have front feed carriages and some are equipped with accessories that permit advancement of continuous forms.

Duplicating equipment used

Some bookkeeping and accounting systems make use of duplicating and copying equipment that has the ability to reproduce certain common information ranging from name and address of a customer to the details of his order, on any and all forms that require the information. For example spirit duplicators which have facilities for printing selectively from masters, or diazo copying units which use translucent masters on which repetitive information may be inserted as it is developed, may be used at various steps in the bookkeeping process.

In all these varying degrees of complexity, equipment for figuring, and methods by which the result of figuring may be entered efficiently into the accounting process, provide the office manager with a very wide range of systems to save work, time and costs in passing numerical information through the office.

The Manufacturers

Adding and Calculating Machines

The following two lists cover the principal manufacturers of figuring equipment. The first list, devoted to makers of adding and calculating machines, is clarified by the use of the following code symbols following each name:

E—Electric machines.

FK—Full-keyboard machines.

FKP—Full-keyboard printing machines.

IDP—Models which read and/or create a "common language," such as punched paper tape, or which otherwise are suitable for use in integrated data processing systems.

M—Manual machines.

MI—Miscellaneous.

NI—No information available at press time on current models.

Tools of the Office

TK—Ten-key keyboard machines.
TKP—Ten-key keyboard printing machines.

Addo-X, Inc., 300 Park Ave., New York 22. (TK-E, M; TKP-E)

R. C. Allen Business Machines, Inc., 678 Front Ave., N. W., Grand Rapids, 4, Mich. (FK-E, M; TK-E, M; TKP-E, M)

Alma Office Machine Corp., 34 E. 30 St., New York 16. (TKP-E, M)

American Voss Corp., 18050 James Couzens Hghwy, Detroit 35. (TKP-E, M)

Barrett Adding Machine Div., Lanston Industries, Inc., 24th & Locust Sts., Philadelphia 3. (NI)

Bohn Duplicator Corp., 444 Fourth Ave., New York 16. (TK-M)

Burroughs Corp., 6071 Second Ave., Detroit 32. (FK-E, M; TKP-E, M)

Calculator Equipment Corp., 556 Central Ave., Orange, N. J. (NI)

Clary Corp., 408 Junipero St., San Gabriel, Calif. (FK-E, M; IDP; TKP-E)

Classic Calculators, Inc., 387 Fourth Ave., New York 16. (TKP-E-NI)

Comptometer Corp., 1735 N. Paulina St., Chicago 22. (FK-E, M; TKP-E)

Control Systems, Inc., 5 Beekman St., New York 38. (TK-E, M)

Facit, Inc., 404 Fourth Ave., New York 16. (TK-E, M; TKP-E, M)

Fremaco International, Inc., 188 W. Randolph St., Chicago 1. (TK-M; TKP-M)

Friden, Inc., 2350 Washington Ave., San Leandro, Calif. (FK-E, M: IDP; TKP-E)

The General-Gilbert Corp., 150 Broadway, New York 38. (TKP-E)

Johnston Adding Machine Co., 13343 Sherman Way, N. Hollywood, Calif. (TK-E; M-NI)

Lightning Adding Machine Sales Co., 2306 W. Slauson Ave., Los Angeles 43. (MI-Small stylus-operated models-NI)

Marchant Calculators, Div. of Smith-Corona Marchant, Inc., 6701 San Pablo Ave., Oakland 8, Calif. (FK-E, TKP-E)

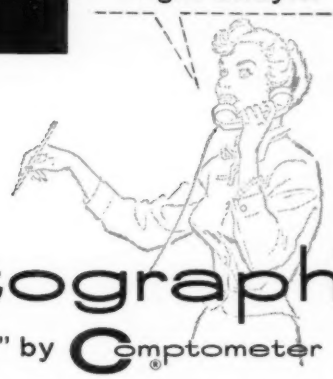
Monroe Calculating Machine Co., Inc., 555 Mitchell St., Orange, N. J. (FK-E, M; IDP; TKP-E, M)

The National Cash Register Co., Main & K Sts., Dayton 9, Ohio. (FK-E, M; IDP)

Olivetti Corp. of America, 580 Fifth Ave., New York 36. (TKP-E)

Olkon Research Corp. of America, 50 Sylvan Ave., Englwood Cliffs, N. J. (NI)

...hold the phone, I'll have it for you right away...



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Regna Cash Registers, Inc., 175 Fifth Ave., New York 10. (FK-E, M; TKP-E, M)

Remington Rand, Div. of Sperry Rand Corp., 315 Fourth Ave., New York 10. (TKP-E, M)

Resulta Adding Machine Co., Box 16, Massapequa, L. I., N. Y. (MI-Small manual machines-NI)

Smith-Corona Marchant Inc., 701 E. Washington St., Syracuse, N. Y. (FK-E, M; TK-E)

Swift Business Machines Co., 51 Church St., Great Barrington, Mass. (TK-M-NI)

Underwood Corp., 1 Park Ave., New York 16. (TKP-E, M)

Victor Adding Machine Co., 3900 N. Rockwell St., Chicago 18. (FK-E, M; TKP-E, M)

Bookkeeping and Accounting Machines and Systems

This list covers a wide variety of equipment, including standard bookkeeping and accounting machines and systems, charts, tables, and scales useful in accounting and bookkeeping, and, in a few cases, accessory equipment. It does not include integrated data procesing equipment (which is covered elsewhere) except for standard punched card systems. The following codes are used:

BA—Bookkeeping and accounting machines of the standard types—i.e, not listed in other categories.

C—Charts, tables, and scales.

E—Small electronic bookkeeping and accounting systems (complete units, no components).

IDP—Standard bookkeeping and accounting machines capable of creating and/or reading a common language record.

MI—Miscellaneous.

NI—No information available at press time on current products.

OWB—"One writing" systems of the binder type.

OWP—"One writing" systems of the "pegboard" type.

P—Punched card systems.

Addo-X Inc., 300 Park Ave., New York 22. (BA)

R. C. Allen Business Machines, Inc., 678 Front Ave., N.W., Grand Rapids 4, Mich. (BA)

American Voss Corp., 18097 Sorrento Ave., Detroit 35. (MI-"One writing" systems of machine type)

Ayres Corp., Box 1081, Wilmington, Calif. (MI-Payroll tax computer)

Bates Accounting Forms Co., Inc., 33 W. 42 St., New York 36. (C; OWB; OWP)

The Blackbourn Systems, Inc., 230 S. Cedar Lake Rd., Minneapolis 5. (OWB)

Burroughs Corp., 6071 Second Ave., Detroit 32. (BA; P)

Business Systems Corp., 436 Pearl St., New York 38. (OWB; OWP)

Carteret Printing Co., 480 Canal St., New York 13. (C; OWP; MI-Carbon forms for accounting machines)

Cel-U-Dex Corp., Box 1125, Newburgh, New Windsor, N. Y. (MI-Binders and indexing devices)

Comptometer Corp., 1735 N. Paulina St., Chicago 22. (OWP)

Consolidated Business Systems, Inc., Jersey Ave., New Brunswick, N. J. (MI-Diversified accounting forms)

Cummins-Chicago Corp., 4740 Ravenswood Ave., Chicago 40. (MI-Punched card reconditioners-NI)

Delbridge Calculating Systems, Inc., 2502 Sutton Ave., St. Louis 16. (C)

The Denominator Co., Inc., 261 Broadway, New York 7. (MI-Manual tabulating units)

Diebold, Inc., Canton 2, Ohio. (OWB)

Ditto, Inc., 6800 McCormick Rd., Chicago 45. (MI-"One writing" systems using spirit duplication)

Evans Specialty Co., Inc., 1800 E. Grace St., Richmond 23, Va. (C-NI)

Friden, Inc., 2350 Washington Ave., San Leandro, Calif. (C; IDP; MI-Billing machines consisting of calculator and typewriter)

General Binding Corp., 1101 Skokie Hghwy., Northbook Ill. (OWP)

The Institute of Business Research, Div. of Keller-Crescent Co., 28 E. Riverside Dr., Evansville 8, Ind. (OWB-NI)

International Business Machines Corp., 590 Madison Ave., New York 22. (P)

International Payroll Machine Co., Box 293, Oxford, Pa. (MI-Payroll denominating machines-NI)

Max Isaacs, 1019 McDonald Ave., Brooklyn 30, N. Y. (C)

Lansdale Products Corp., Box 568 Lansdale, Pa. (MI-control boards)

LeFebure Corp., 716 Oakland Rd., N.E., Cedar Rapids, Iowa. (OWB; OWP)

David Lyons Co., 2100 Greenleaf St., Evanston, Ill. (C)

McMillan Book Co., 701 E. Genesee St., Syracuse, N. Y. (OWB-NI)

Master-Craft Corp., Div. of Shaw-Walker Co., 831-903 Cobb Ave., Kalamazoo, Mich. (OWB; OWP)

Melcar Office & Business Equipment, 480 Canal St., New York 13. (C)

Monroe Calculating Machine Co., Inc., 555 Mitchell St., Orange, N. J. (BA; C)

The National Blank Book Co., P.O. Box 791, Holyoke, Mass. (OWB)

The National Cash Register Co., Main & K Sts., Dayton 9, Ohio. (BA; E; IDP; MI-"One writing" paper systems)

Norfield Methods & Procedures, Inc., 933 S. Clinton Ave., Oak Park, Ill. (OWP)

Olivetti Corp. of America, 580 Fifth Ave., New York 3. (BA)

Payroll Tax Service, Inc., 44 W. 29 St., New York 1. (C; OWP)

W. H. Pusch, 427 W. Lynwood, San Antonio, Texas. (C)

Recordak Corp., 415 Madison Ave., New York 17. (MI-Photographic accounting systems)

Remington Rand, Div. of Sperry Rand Corp., 315 Fourth Ave., New York 10. (BA; IDP; P)

The Reynolds & Reynolds Co., 800 Germantown Ave., Dayton 7, Ohio. (OWP-NI)

Royal McBee Corp., Westchester Ave., Port Chester, N. Y. (E; OWP; P)

S. K. Forms Co., 1619 Walnut St., Philadelphia 3. (C; OWB)

Safeguard Corp., Lansdale, Pa. (OWP)

The Shaw-Walker Co., Muskegon, Mich. (OWB; OWP)

The C. E. Sheppard Co., 4401 21 St., Long Island City 1, N. Y. (OWB; OWP)

Silver Bells, Ltd., P.O. Box 982, Carmel, Calif (C)

Specialty Papers Co., 2028 Farrington St., Dallas. (C-NI)

Speedograph, Inc., 5440 S. Ashland Ave., Chicago 9. (OWP)

Tab Products Co., 995 Market St., San Francisco 3. (P)

The Todd Co., Inc., Div of Burroughs Corp., 6071 Second Ave., Detroit 32. (OWB; OWP)

UARCO Inc., 141 W. Jackson Blvd., Chicago. (MI-Autographic registers)

Underwood Corp., 1 Park Ave., New York 16. (BA; IDP)

Universal Business Machines, Inc., P.O. Box 5183, Columbia, S. C. (MI-Electro-mechanical sorting machines)

Victor Adding Machine Co., 3900

our payroll's under control . . .

. . . or is it under control?

with Burroughs Accounting Machines, you know

Best bet for any businessman harassed by accounting data that're tardy, error-ridden or just plain inadequate: *bring Burroughs Sensimatic Accounting Machines into action fast.*

It doesn't matter where the trouble is—payroll, receivables, payables, inventory or elsewhere. The Sensimatics can take on any one job or, at the flick of a knob, wrap up many—quickly and automatically. And you can be sure that the figure-facts you need to comprehend, control and guide your business with pinpoint precision will be in your hands *when* you need them.

Details? Demonstration? Call our nearby branch, or write to Burroughs Corporation, Burroughs Division, Detroit 32, Michigan.

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"NEW DIMENSIONS / in electronics and data processing systems"

Use Readers' Inquiry Coupon on Page 188

N. Rockwell St., Chicago 18. (BA; P)

Visirecord, Inc., Copiague, L. I., N. Y. (OWP-NI)

Wilson Jones Co., 209 S. Jefferson St., Chicago 6. (OWB; OWP)

Machine Work Station Equipment

Because of the importance of good physical arrangements of machines, work areas, and record housing facilities in creating efficient work stations, manufacturers of some of the major items of equipment involved are listed below. The following codes are used to indicate the types of products offered:

MD—Machine desks.
MI—Miscellaneous.
MS—Machine stands.
MT—Machine tables.
NI—No information available at press time on current products.
PD—Posting desks.
PS—Posting stands.
PT—Posting trays.
TD—Tub desks.
TF—Tub files.

The Acorn Co., 4605 W. 21 St., Chicago. (MD; MS; MT; PT; TF)

All-Steel Equipment Inc., 100 Griffith Ave., Aurora, Ill. (MD;MT)

Art Steel Co., Inc., 170 W. 233 St., New York 63. (MD; MS; MT)

Automatic File & Index Co., 549 W. Washington Blvd., Chicago 6. (PT; TF)

Badger, Inc., King at Front St., La Crosse, Wis. (MS)

The Bentson Mfg. Co., Aurora, Ill. (MD)

The Brunswick-Balke-Collender Co., 623 S. Wabash Ave., Chicago 5, Ill. (MD)

The Buckstaff Co., 1122 S. Main St., Oshkosh, Wis. (MT)

Burroughs Corp., 6071 Second Ave., Detroit 32. (MD; MS; PD; PS; PT)

Business Efficiency Aids, 8114 N. Lawndale Ave., Skokie, Ill. (PS; PT; TD; TF)

Cole Steel Equipment Co., Inc., 415 Madison Ave., New York 17. (MD; MS; MT; PD)

Columbia Steel Equipment Co., Inc., 415 Madison Ave., New York 17. (MD; MS; MT; PD; PS; PT; TD; TF)

Corry-Jamestown Mfg. Corp., 44 N. Center St., Corry. Pa. (MD; PD; PT)

Cramer Posture Chair Co., 625 Adams St., Kansas City, Mo. (MS)

Currier Mfg. Co., 2448 W. Larpenteur Ave., St. Paul 6, Minn. (PT; TF)

D & L Office Furniture Co., 61 W. Hubbard St., Chicago. (MD)

Dependable Mfg. Co., 2407 Fort Crook Rd., Bellevue, Neb. (MS)

Desks of America, Inc., P.O. Box 6185, Bridgeport 6, Conn. (MT)

Diebold, Inc., 2011 Mulberry Rd., Canton 2, Ohio. (PS; PT)

Dorset Steel Equipment Co., 2514 W. Dauphin St., Philadelphia 32. (MD; MT)

Durable Metal Products Co., 38-42 Review Ave., Long Island City 1, N.Y. (MT)

Excellent Cabinet Works Co., 415 Withers St., Brooklyn 22, N. Y. (MT)

Louis H. Farber Co., 31 E. Congress St., Chicago 5. (MS)

Ferris Business Equipment, Inc., 45 Seymour St., Stratford, Conn. (TF)

Garrett Tubular Products, Inc., P.O. Box 237, Garrett, Ind. (MD; MS)

The General Fireproofing Co., 413 Dennick Ave., Youngstown, Ohio. (MD; PD; TD; TF)

The Globe-Wernicke Co., Norwood, Cincinnati 12. (MD; MS; MT)

Harrison Steel Desk & File Co., 4718 W. Fifth Ave., Chicago 44. (MD)

Haskell, Inc., P.O. Box 5273, Pittsburgh 6, Pa. (MD; MS; MT)

Hedges Mfg. Co., 2931 Wentworth Ave., Chicago 16. (TF)

Hillside Metal Products, Inc., 262-270 Passaic St., Newark 4, N. J. (MD)

Imperial Desk Co., 1312 W. Florida St., Evansville 7, Ind. (MD)

Indiana Desk Co., Inc., 1226 Mill St., Jasper, Ind. (MD; MS; MT)

Intasco Corp., 3021 Carroll Ave., Chicago 12. (PS; PT)

Invincible Metal Furniture Co., 26 & Franklin Sts., Manitowoc, Wis. (MD)

Jasper Office Furniture Co., 13 & Vine Sts., Jasper, Ind. (MD; PD)

Jasper Table Co., Inc., 206 Main St., Jasper, Ind. (MT)

Jayem Sales Corp., 31 Coffey St., Brooklyn 31, N. Y. (MS; MT; TD; TF)

KOL, Inc., 2323 Ellis Ave., St. Paul 14. (MS; MT)

Karl Mfg. Co., 32-24 Ionia Ave., S.W., Grand Rapids 2, Mich. (MS; MT)

King Posture Chair Co., 953 S. Raymond Ave., Pasadena 2, Calif. (MT)

LeFebure Corp., Cedar Rapids, Iowa. (MD; MS; PD; PS; PT; TF)

Lit-Ning Products Co., 3907 Duquesne Ave., Culver City, Calif. (PS; PT)

Logan Business Products, Inc., Vue-Fax Div., 655 Main St., Westbury, L. I., N. Y. (PD; TF)

The Marshallan Mfg. Co., 1061 W. 11 St., Cleveland 13. (MS; MT)

Maso Steel Products, 53 W. Jackson Blvd., Chicago 4. (MS; MT; PT)

Meilink Steel Safe Co., 1672 Oakwood Ave., Toledo, Ohio. (MS)

Metalstand Co., 7520 State Rd., Philadelphia 36 (MS)

Midwestern Mfg. Corp., 419-20 Lemcke Bldg., Indianapolis 4, Ind. (PS; PT)

Modern Steelcraft, 230 Fifth Ave., New York. (MS; MT)

Monarch Metal Products, Inc., New Windsor, Newburgh, N. Y. (TF)

The Mosler Safe Co., 320 Fifth Ave., New York. (PD)

Morval Corp., Herkimer, N. Y. (MD)

Ray Myers Corp., Endicott, N. Y. (MD; MS; MT; PD; PS; PT; TD; TF)

Myrtle Desk Co., P.O. Box 1750, High Point, N. C. (MD; MT; PD)

The National Blank Book Co., Holyoke, Mass. (PS; PT)

Nemes Furniture Factory, 2631 N. Lehmann Court, Chicago 14. (MD)

Norfield Methods & Procedures, Inc., 933 S. Clinton Ave., Oak Park, Ill. (PT)

Northwest Metal Products Co., 1337 E. Mason St., Green Bay, Wis. (MD; PD; TF)

Nu-Craft Products Co., 321-327 Clarkson Ave., Brooklyn 26, N. Y. (PS; PT)

Orna-metal, Inc., 2412 S. Seventh St., St. Louis 4. (MS)

Peerless Steel Equipment Co., 6600 Hasbrook Ave., Philadelphia 11. (MD; PD)

Plan Hold Corp., 5204 Chakemco St., South Gate, Calif. (TF)

Posting Equipment Corp., 1721 Elmwood Ave., Buffalo 7, N. Y. (PS; PT)

Pres-To-Line Corp. of America, 2339 Cotner Ave., Los Angeles 64. (MI-Copyholders, desk stabilizers, typewriter pads)

Quigley Furniture Co., 62 Foster St., Whitesboro, N. Y. (MS;MT)

Remington Rand, Div. of Sperry Rand Corp., 315 Fourth Ave., New

York 10. (MD; MS; MT; PD; PS; PT; TD; TF)

J. K. Risbel Furniture Co., 1201 W. Third St., Williamsport 19, Pa. (MD; MS; MT; PD; TF)

Riteform Chair Co., Inc., 2300 Ellis Ave., St. Paul 5. (MT)

W. T. Rogers Co., 518 Division St., Madison 4, Wis. (MD)

Rutherford Duplicator Co., P.O. Box 13087, Houston 19, Tex. (MS)

The Schwab Safe Co., Lafayette, Ind. (MD; MS; MT; PD; PS; PT)

The Shaw-Walker Co., Muskegon, Mich. (MD; MS; PD; PS; PT)

Sherman-Manson Corp., Celina Rd., St. Marys, Ohio. (MS; MT)

Speed-O-Print Corp., 1801 W. Larchmont Ave., Chicago 13. (MS)

Standard Furniture Co., Herkimer, N. Y. (MD; PD)

Standard Pressed Steel Co., Columbia-Hallowell Div., Box 919, Jenkintown, Pa. (MD; PD; PT; TD)

Stationers Guild of America, 1421 Chestnut St., Philadelphia 2. (PS; PT)

Steelcase, Inc., 1491 Division Ave., S., Grand Rapids 2, Mich. (MD)

Steel-Parts Mfg. Co., 4630 W. Harrison St., Chicago 44. (MS; MT)

Stempel Mfg. Co., 2830 Roberts St., Dallas 3. (MT)

Stewart Office Furniture Co., 6523 N. Hoyne Ave., Chicago 45. (MT)

Stolper Steel Products Corp., Menomonee Falls, Wis. (MS; MT)

Sun Engineering & Mfg. Co., Inc., Pinellas International Airport, St. Petersburg, Fla. (MT)

Systems Sales Co., P.O. Box 343, Binghamton, N. Y. (MD; TD)

Tab Products Co., 995 Market St., San Francisco 3. (MD; PS; PT; TD; TF)

Tiffany Stand Co., Inc., 7350 Forsyth Blvd., St. Louis 5. (MS; MT)

Toledo Guild Products, Inc., 228 Fassett St., Toledo 5, Ohio. (MT)

The Toledo Metal Furniture Co., 1400 Hastings St., Toledo 7, Ohio. (MD; MS; MT)

Underwood Corp., 1 Park Ave., New York 16. (MS; PS)

The Victor Safe & Equipment Co., Inc., 315 Fourth Ave., New York 10. (MD; PD)

Visirecord, Inc., Copiague, L. I. N. Y. (MD; PD; PT; TD; TF)

Wassell Organization, Inc., Sylvan Ave., Westport, Conn. (PD)

Watson Mfg. Co., 63 Taylor St., Jamestown, N. Y. (PT; TF)

Welch Metal Products, Inc., 8557 San Fernando Rd., Sun Valley, Calif. (MS)

Wells Furniture Mfg. Co., Laurel, Miss. (MT)

Wilson Jones Co., 209 S. Jefferson St., Chicago 6. (PS; PT)

Wolber Duplicator & Supply Co., 1201 Cortland St., Chicago 14. (MS)

The Worden Co., 200 E. 17 St., Holland, Mich. (MD)

The Wright Line, Inc., 160 Gold Star Blvd., Worcester 6, Mass. (TF)

Yawman & Erbe Mfg. Co., 1099 Jay St., Rochester, N. Y. (MD; PD; PS; PT)

Addressing Equipment

MUCH OF THE information which flows through the office must ultimately be redirected to some point outside of the office. It may be transmitted by telephone or telegraph lines, by messenger service, or through conversations between persons, but the bulk of it will be transferred by the United States Post Office Department.

The addressing of mail is therefore a very vital function which every office must perform, and perform as accurately and as quickly as possible if it wishes to have its operations carried out smoothly and its costs kept within reasonable limits. In a large company, of course, the volume of out-going mail is very high, and the addressing of information becomes a major operation in the work schedule.

Many types of business correspondence require individual typing and sometimes even manual writing of addresses, but ways have been found to reduce the time and effort needed for this work, in some cases, by simplifying and eliminating addressing operations.

In typing conventional business correspondence, the address is normally written twice, once on the letter itself and then again on the envelope. The use of the window envelope, which permits the address on the letter to show through and serve in place of the address usually written on the envelope, has reduced addressing to one step.

Greater care is necessary with this procedure: in placing the address on the letter one must insure that it coincides with the window, but this is no problem if the stationery or form has guide marks to indicate the proper location of the address.

Window envelopes not only reduce the effort of the addressing operation by eliminating one step, they also completely avoid the danger of putting the wrong letter into an envelope.

Most offices are reluctant to use window envelopes for ordinary correspondence and confine their use mainly to the mailing of forms. It is felt this type of envelope does not reflect as great a show of courtesy in individual correspondence as does the envelope which carries a separately typed address. With the increasing volume of paperwork and higher costs, it seems very possible that business may one day accept the window envelope for individual letters as it does now for bills or impersonal business forms.

Post cards are also being used to reduce addressing operations. Because of their obvious lack of privacy, they are not suitable for most individual correspondence but they are quite adequate for use in many routine matters. Many companies, such as utility firms, use them in punched card form for billing, for acknowledgments of orders and for other functions which do not require individual messages.

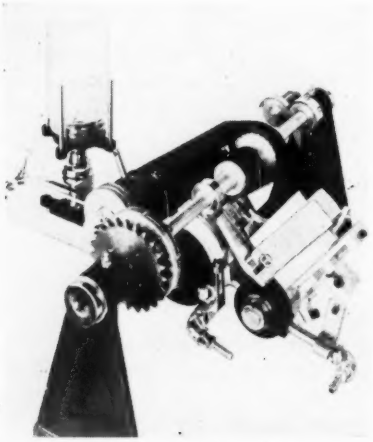
Sometimes, when addresses must be typed on both the correspondence—whether it be a letter or a form—and an envelope, use is made of "slave" typewriters. Thus a single typing takes care of the operation as the first typewriter controls the second to type the same address at the same time.

Most equipment designed for addressing, however, is desired to reproduce names and addresses from a prepared list that is used fairly often. The list of addresses is carried on some master form such as a spirit master, a stencil, or an embossed plate which allows the entire addressing operation to be

For a quick index to the "Tools of the Office" section see page 72

processed rapidly. The master forms are prepared well ahead of mailing time and can be used repeatedly.

Firms which have large mailing operations find the current trend to consolidate the addressing function with some other operation very helpful. For example, certain types of addressing machines may be controlled by punched cards. This feature automatically permits the selection and rejection of cards from a master list of potential addresses. With other types, the address is carried on or attached to the card as a small spirit master, while in still other forms of punched card equipment, the cards may be used to actuate a printing mechanism, following normal punched card routines. Some cards which have the address printed on them can be scanned by a photoelectric "eye" and printed on address tapes or labels by the facsimile process.

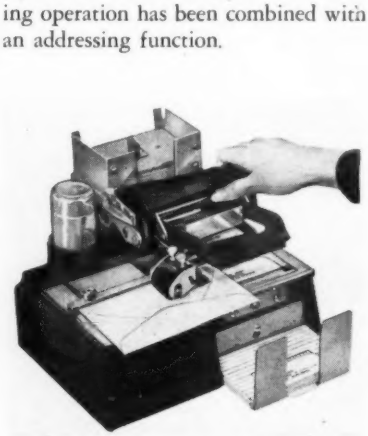


Rotary labeling head applies or cuts individual labels. Picture courtesy of Cheshire Inc.

When addressing operations are combined with other work routines, it is considered to be an integrated system since the cards are of the same type as used elsewhere in the company, and since the cards are prepared automatically as a result of some other operation.

Great savings of time and effort occur when the addressing medium, of whatever type, has been designed to carry selection instructions. Embossed plates may have code systems notched on them so that the addressing machine may select or reject them according to a predetermined pattern.

A publishing company may use codes to indicate date of subscription expiration, size of company, type of company and other information which it finds necessary in its work. These codes can then be used to address selected groups. This type of coding represents an early product of systems analysis. It is a short cut by which a sorting operation has been combined with an addressing function.



Automatic addressing machine works on spirit transfer method process. Picture courtesy of Master Addresser Co.

There are many types of addressing equipment on the market. The simplest of these include ordinary rubber hand stamps used for addressing in offices which send the bulk of their mail to a particular address.

Other equipment ranges from small hand devices in which addresses are carried on a roll form spirit master to high speed printers used for output from electronic computer systems.

Aside from equipment used with punched cards, the three basic methods used in most addressing equipment are embossed metal plates, spirit masters and stencils. Other machines are available which use special transfer processes that resemble the spirit masters, and some machines use an "electrostatic" method.

The "electrostatic" method is one in which the address is printed invisibly on a label in the form of an electrical charge. The label is exposed to a spray of ink carrying an opposite electrical charge, and the ink is attracted to the charged portion of the paper and visibly forms the desired letters and numerals. This method appears to be potentially the fastest available, making possible speeds of thousands of lines a minute. One of its most promising uses is as an output device for use with electronic computers.

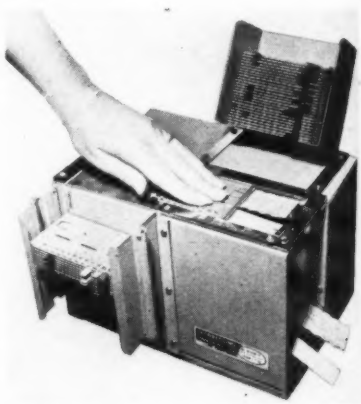
Special methods such as the transfer processes and "electrostatic" type are used in elaborate equipment intended for the production of huge volumes of work.

While not as fast as the newer systems, the three primary methods, embossed plates, spirit masters and stencils, are adaptable to small inexpensive equipment as well as complete operations and they offer great variety.

Some machines which are small and manually operated do nothing more than address envelopes, or tapes and labels which will later be placed on envelopes and packages.

With the more complex machines, features such as devices to select and reject coded addresses, automatic feeds, counters, daters and perforators, are available. The more complex machines are generally powered by electricity.

Some larger machines, in addition, are capable of printing complete letters, including the letterhead, text, and signature, and certain types of machines are in effect small printing presses as they are equipped to print text material in a variety of colors in addition to the address.



Addressing Machine Co.'s "Quik-Stripper" removes plates and cards from the Addressograph frames.

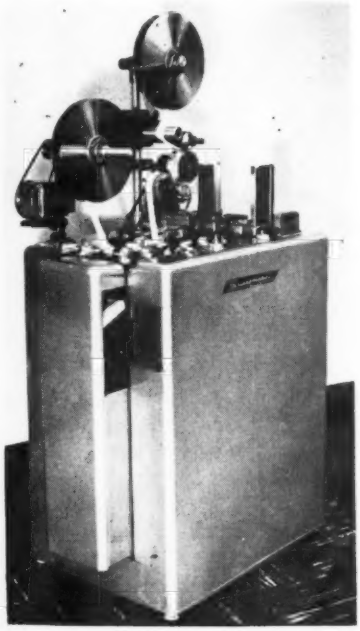
Addressing may be almost incidental to the main function of the most versatile machines. Such equipment may punch and imprint cards, number, sort, accumulate totals and provide carbon copies of addressed material.

Integrating addressing equipment into office systems is made easier by the fact that plates, masters and stencils used in the simplest of machines can be prepared automatically. Even when typewriters are used, addressing may be controlled by punched card inputs.

Systems duplicators may be used for extending integration further in an office if they are also used for addressing labels. For example, a spirit-type sys-

tems duplicator may serve this function using a master originally prepared for some bookkeeping purpose. Or in some cases translucent masters used in diazo copying processes may be employed to the same effect.

As with other important office functions, a wide variety of equipment is available so that each office may choose the means of addressing its mail which will be most efficient in its particular work routines.



Scriptomatic, Inc.'s high speed tape lister prints five-line addresses from cards at rate of 11 cards per second.

The Manufacturers

Following is a list of the principal manufacturers of addressing machines and systems. The following explanatory codes are used to indicate the nature of products offered.

E—Electric machines.

ES—Machines using an electronic scanning principle such as facsimile.

M—Manual machines.

MI—Miscellaneous.

NI—No information available at press time on current products.

R—Machines using the relief principle—that is, printing from embossed plates, type, etc.

SP—Machines using the spirit duplicating principle.

ST—Machines using the stencil duplicating principle.

Addressing Machine Co. of California, 679 Mission St., San Francisco. (NI)

Addressograph-Multigraph Corp., 1200 Babbit Rd., Cleveland 17. (ES-NI; MI-Special transfer method-NI; R-E, M)

Alden Systems Co., Alden Research Center, Westboro, Mass. (NI)

Dashew Business Machines, Inc., 5886 Smiley Drive, Culver City, Calif. (MI-Machines with inputs from punched cards and tapes; R-E, M)

The Dick Mailer Co., 137 W. Tupper St., Buffalo 1, N. Y. (MI-Address label machines-NI)

Du Prints, Inc., 1502 S. Main St., Los Angeles 15. (SP-E, M)

Eastman Kodak Co., 343 State St., Rochester 4, N. Y. (MI-Special electronic system using punched cards-NI)

Efficiency Machines Corp., 87 Transverse Rd., Garden City, N. Y. (R-E-NI)

The Elliot Addressing Machine Co., 143 Albany St., Cambridge 39, Mass. (ST-E, M)

Farrington Mfg. Co., Industrial Center, Needham Heights 94, Mass. (R-E, M; SP-E)

Friden, Inc., 2350 Washington Ave., San Leandro, Calif. (MI-Tape-controlled typewriters)

The Heyer Corp., 1850 S. Kostner Ave., Chicago 23. (SP-M)

International Business Machines Corp., 590 Madison Ave., New York 22. (MI-Electrostatic label printers-NI)

Krengel Mfg. Co., Inc., 227 Fulton St., New York 7. (R-NI)

Marsh Stencil Machine Co., Belleville, Ill. (ST-M)

Master Addresser Co., 6500 W. Lake St., Minneapolis 16, Minn. (SP-M)

The Multistamp Co., 527 W. 21 St., Norfolk 10, Va. (ST-M)

National Address Plate Co., 4615-23 W. Huron St., Chicago 44. (R-E, M)

Nettle Mfg. Co., 27 Huntington Ave., Boston 16. (R-M)

Rex-Rotary Distributing Corp., 387 Fourth Ave., New York 16. (R-E, M)

S & M Distributing Co., Zip-O-Riter Products, 3875 Garland St., Wheat Ridge, Col. (SP-M)

Scriptomatic, Inc., 300-316 N.11 St., Philadelphia 7. (SP-E)

Speed-O-Print Corp., 1801 W. Larchmont Ave., Chicago 13. (R-M; ST-E, M)

Visirecord, Inc., Copiague, L. I., N. Y. (SP-M-NI)

Weber Marking Systems, Div. of Weber Addressing Machine Co., Inc., 215 E. Prospect Ave., Mount Prospect, Ill. (SP-M; ST-M)

Chauncey Wing's Sons, 78 Pierce St., Greenfield, Mass. (MI-Machine which applies address labels in roll form to flat mailing pieces)

Dictating and Transcribing Equipment

AN EXECUTIVE DICTATES a letter to a secretary. She writes the letter in her notebook, returns to her desk, and rewrites the letter on her typewriter. This duplication of effort is quite contrary to the principle of efficient working procedures in office systems in which obvious repetition of work should be eliminated.

Dictating and transcribing equipment was designed to avoid this unnecessary duplication of work. It is true that a dictation machine cannot remind the executive of certain details, it cannot look up names and addresses for him and it cannot gather necessary information from the files.

But if the user of this type of equipment employs the right techniques of using the machine, and if the secretary is not absolutely essential at the time of dictation, then person-to-person dictation can be inefficient.

Some executives feel that there is a loss of prestige and power when they dictate to the machine rather than to a human being. But using the dictating machine does not take away from an executive the services of a stenographer or secretary. Rather, it offers a great many advantages that would not be possible with the older method of dictating letters.

One of the biggest advantages to be gained from dictating and transcribing equipment now on the market is the freedom it gives the office administrator to dictate whenever and, within some limitations, wherever, he chooses. His letter-writing schedule no longer has to be adjusted to that of his secretary. He may answer letters as he reads through his morning mail when the pertinent topics are freshest in his mind. If his secretary is out to lunch he does not have to wait for her return or for a prolonged dictating session sometime later in the day. He can do work

at the office after hours, on weekends, while he is travelling and any place where he can take his machine with him.

If—and it often does occur—the busy executive has a peak load of correspondence, it is no longer necessary for one person to write all the letters. Every secretary, even though she may use a standard stenographic system, has usually personalized her note taking so that in the majority of cases other people cannot work too efficiently with her notes. With a dictating machine, provided that the dictator has used the machine well, it is possible for other typists to transcribe the letters. The work load can then be distributed more evenly among the typing staff in rush periods, providing the executive with faster service.

More work possible

When the dictating machine is being used, the secretary is free to do more work during the day. Not only does she not have to write each letter twice, she no longer has to sit patiently and unproductively in her boss' office while he answers a telephone call, speaks to a visitor, or rushes off to handle an urgent detail. The secretary gets the satisfaction of accomplishing more each day and the executive can use her time more efficiently to get more of his detail work done.

The latest machines on the market are designed to provide the most efficient possible use of the machine. Controls have been simplified, and sound fidelity is good on any well-made machine. Some of the models available have all controls placed on the microphone.

To make the best use of the equipment it is necessary that the dictator know the technique required in using dictating machines. If he does not, then the time lost by the secretary finding it necessary to rewrite a letter she is transcribing or time wasted by her having to look up the dictator to ask questions offsets all the advantages that can be gained through use of the machine.

The first and one of the most important elements of good dictating technique is clear diction. Even if the enunciation is exaggerated, it is absolutely essential that the dictator speak clearly. It is also best if the dictator speaks with an even volume of sound and is careful not to slur final syllables or to drop his voice so that "a" sounds like "the," and so on. Basically, this same technique applies when dictating to a secretary, except of course that a machine cannot ask for verification of a word.

Adequate instructions necessary

The second essential technique of good machine dictating is that the user must be sure to give adequate instructions. If he expects that the correspondence will be transcribed by a typist unfamiliar with the technical words he is using, he should spell them out. If an address is to be found in the files he should indicate this. The dictator should also be specific about numbers, about the number of carbon copies to be made if it is not a routine letter, and any exception that may be found. The instructions to the typist should be preceded by an indication that directions rather than letter copy are to be given. Prefixing a word such as "operator" to the instructions may be helpful.

Proper use of the correction facilities available on most machines is also necessary for good dictating. If at any point a correction is to be made in the text, or if in the midst of the letter the executive realizes that an extra copy should be made, he should press the correction key (if that is the method used with his machine), or be sure to note the correction on a log sheet. Otherwise, if this point is omitted, the result is that the typist is well into the letter before spotting the change and has to start from the beginning to make the correction.

If the dictator properly utilizes the machine by mastering the essential steps of dictating technique such as speaking clearly, giving adequate instructions, noting properly corrections to be made and indicating letter length by whatever means are provided, then the machine can be of great value to both him and his secretary.

Microphone contains controls such as stop/start and playback. Picture courtesy of Peirce Dictation Systems.

The office may make use of the machines on both an individual or collective basis. If an executive has a machine for his private use, he of course receives the main benefits of the machine.

If the machine is used collectively, than greater savings are accrued to the company. Machine facilities can be shared where there is relatively little dictating done by individuals.

This sharing may be done in several ways. One way is for all the dictators to use the same machine either by working with it at a central location or by having it brought to them when they need it. This can be done easily because most of the machines are small and lightweight and can be either carried from place to place or mounted on a rolling stand.

Network dictation facilities offered

Network dictation facilities are another means of sharing dictating equipment among a number of individuals. In this case telephone facilities are connected to one or more centralized dictating machines. Standard telephone systems can be used with some equipment. In other cases, private intra-company telephone systems may be used, and in still other cases, direct wiring can be provided between the dictating stations and the central recorder.

The machines are usually selected automatically so that a person who picks up the phone is switched to a free unit. If all units are busy, he receives a busy signal. The telephone is equipped with all facilities for controlling the machine including correction indications and stop/start controls.

Real machine efficiency is provided by network dictation if the system serves a number of executives who do relatively little individual dictating as it permits a sharing of the work load by the typists. This reduces the number of typists actually required for a given number of executives.

There is an increasing trend to adapt telephone and intercommunications facilities for dictating equipment and this is likely to continue.

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Voicewriter

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McGRAW EDISON

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ment falls into three unit classifications. There are some units designed only for dictating, units designed only for transcribing and units for both dictating and transcribing. All of these machines use many of the same basic components and the differences among models consist largely of accessory facilities.

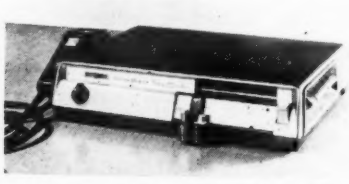
Playback means required

Both dictating and transcribing units require some means of playing back what has been dictated. The dictator often wishes to know what he has already said and quite obviously, the typist needs to hear the material she is to transcribe. The dictator may be satisfied with a loudspeaker for playback, or with playback through the microphone. The typist may find the loudspeaker inadequate if she is working in a room where other machines are being used. In this case, earpieces are effective for relaying sound without causing disturbance in the room.

The dictator can use start/stop controls located on either the machine itself or on the microphone, but it is more convenient for the typist who is using both hands to have this type of control through use of a foot pedal or, as with some units, controls attached to the typewriter.

Another control which is needed by the typist is one which will permit her to adjust the speed of playback to her typing speed. In some machines this is accomplished simply by varying the mechanical playback speed. This alters the pitch of the recorded sound but not the intelligibility of the recorded material.

NOT every transcribing machine offers adjustability of playback speed but all machines are equipped with a backspacing control which can be used to make the machine repeat the last few seconds of dictating. This is an essential feature since if transcribing machines were not equipped with it, there would be no convenient method of reversing for the very short intervals needed in most transcribing. For this reason, most tape recorders are not classed as dictating and transcribing machines.



Dictaphone Corp.'s "Time Master" combines the facilities of recording and transcribing in trim, efficient machine.

The basic differences between dictating and transcribing machines lie in the accessories. Combination units do not cost much more than either of the single purpose units but they may be uneconomical if the dictator's and the typist's schedules conflict. If the executive uses the machine after hours, or at times when the typist does not need it for transcription, then it can be the most efficient.

Another current trend seen in this field is the use of portable dictating machines, not only in the field but also in airplanes, trains, or cars. The machines are lightweight so that they may be carried around easily. Some can be used in automobiles and several airlines offer dictating services on some of their flights.

Transistorized, Soundscriber Corp.'s portable dictating machine weighs six pounds, is battery powered.

Dictating machines differ in the type of recording medium used. Most of the equipment on the market now records on either plastic disks or belts or on magnetic tapes, disks, belts or paper. With the plastic media, the dictating machine cuts a groove-like sound track such as is found on phonograph records. With the magnetic media, the sound impulses are recorded as magnetic spots.

Some of the plastic media can be resurfaced and used a number of times, but the material is inexpensive and is usually intended to be used only once, retained as long as necessary and then discarded.

Magnetic media can be erased and re-used an indefinite number of times. Thus, errors in dictation can be corrected by backspacing and dictating over the original material as the new dictation automatically erases the old. Some machines using magnetic tape provide for easy change of the medium by having the tape available in cartridge form. A few models using magnetic paper can record duplicate copies, as two sheets can be placed on the machine at once.

All dictating equipment should be provided with some form of index or log sheet or card which will indicate letter length and errors on the record so that the typist can adequately space her work and be prepared for corrections. In some cases indexing facilities are provided on the medium itself.

The Manufacturers

The following list shows the major manufacturers of office dictating and transcribing equipment. While numerous standard tape recorders can be used in the office, they are not listed here unless the manufacturer has stated that this type of equipment is modified to provide the additional facilities normally expected on office equipment.

The following codes indicate the type of equipment available:

MB—Magnetic belt machines.

MD—Magnetic disk machines.

MP—Magnetic paper machines.

MT—Magnetic tape machines.

N—Network systems.

NI — No information available at press time on current products.

PB—Plastic belt machines.

PD—Plastic disk machines.

TR—Tape recorders modified for office use.

American Dictating Machine Co., Inc., 65 Madison Ave., New York 16. (MD; N)

Ampro Corp., 2835 N. Western Ave., Chicago 18. (TR-NI)

Comptometer Corp., 1735 N. Paulina St., Chicago 22. (MB)

DeJur-Amsco Corp., 45-01 Northern Blvd., Long Island City 1, N. Y. (MT)

Dictaphone Corp., 420 Lexington

For a quick index to the "Tools of the Office" section see page 72

NOW! THE 4-IN-1 DICTATING MACHINE!

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IT'S A PORTABLE. Weighs only 6 pounds! Needs no carrying case. Slips easily into briefcase or bag. Lets you dictate on-the-spot . . . on-the-go . . . anywhere.

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IT'S A TRANSCRIBER. Just plug in listening device and foot control. Transcription is easy, playback clear. Discs can also be played on 33⅓ RPM phonograph.

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SAVE WITH SOUNDSCRIBER! Save money! Save time! Save buying separate portables . . . office machines . . . transcribers . . . and conference recorders! The 6-pound SoundScriber does the work of all four.

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Please send information on the new, battery-powered, all-purpose portable.

NAME_____

TITLE_____

In a hurry? Just call your local SoundScriber representative. He's listed in the yellow pages under "Dictating and Recording Equipment."

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Ave., New York 17. (MI-telephone and conference recorders; MT; N; PB; TR)

Thomas A. Edison Industries, McGraw-Edison Co., West Orange, N. J. (N; PD; TR)

The Gray Mfg. Co., 16 Arbor St., Hartford 1, Conn. (N; PD)

Magnedisk Dictating Co., 52 E. Brink St., Crystal Lake, Ill. (MD-NI; N-NI)

Miles Reproducer Co., Inc., 812 Broadway, New York 3. (N; PB)

Mohawk Business Machines Corp., 944 Halsey St., Brooklyn 33, N. Y. (MT; N; TR)

No. American Philips Co., Inc., Dictating Equipment Div., 230 Duffy Ave., Hicksville, L. I., N. Y. (MT)

Olkon Research Corp. of America, Vanguard Business Machines Div., 150 Sylvan Ave., Englewood Cliffs, N. J. (N-NI; MP-NI; MT-NI; TR-NI)

Pacific Instruments Corp., Stenocord Div., 7046 Hollywood Blvd., Los Angeles 28. (MB-NI)

Peirce Dictation Systems, 5900 N. Northwest Highway, Chicago 31. (MB; N)

Permaflux Products Co., 4101 San Fernando Rd., Glendale 4, Calif. (MI-telephone pickup for use with recording equipment)

Scribe Internationale, Div. of General Sintering Corp., 10005 Franklin Ave., Franklin Park, Ill. (MT; N; TR)

The SoundScriber Corp., 6 Middletown Ave., P. O. Box 1941, North Haven, Conn. (N; PD)

Duplicating and Copying Equipment

DUPLICATING and copying equipment is of great interest to office managers not only because of the great variety of machines that are on the market, but because of their usefulness in solving an office's paperwork problems.

Spirit and stencil duplicators have long been used to make multiple copies of reports, notices and other material for general distribution. Many duplicators today are being used for systems work, as when information on a spirit master is transferred selectively to different forms covering the same transaction. A duplicator used to transfer repetitive information from form to form in the course of the work is in essence an elementary form of integrated data processing.

Office copying machines, equipment which copies material directly without requiring the preparation of some intermediate such as a master or stencil, have also grown in popularity. They permit an individual to make a copy of material passing through his hands so that the next man in the routing system does not have to wait for him to finish with it. Copying machines can also simplify correspondence when a simple answering note can be made on an incoming letter. The original letter can be returned to the sender while the copy made of the letter and answer can be filed.

Machines have unlimited uses

The seemingly unlimited uses of duplicating and copying equipment have caused systems planners, including office managers, to devote a great deal of time to studying how these machines may be used to reduce the time and effort spent on paperwork in the office.

At least 13 distinct processes

This magazine recognizes at least thirteen distinct processes which can be used for copying or duplicating, not counting such methods as producing extra copies through the use of carbon paper, automatic typing, conventional printing methods and automatic outputs from integrated data processing and communications systems.

Seven of these are called "copying" processes as they make more or less exact copies of original material. They are usually intended for short runs, such as from one to six copies, are much slower than duplicating processes and are more expensive as far as the cost of individual copies is concerned. Copying processes can, however, reproduce art work, letterheads, drawings, pictures and other material without requiring a special master.

The seven processes considered in this group are diazo, Electrofax, facsimile, photocopy, Thermo-Fax, Verofax and xerography. Each differs from the others in some significant way. For example, one process does not readily copy the color yellow; another is not sensitive to ordinary blue ballpoint pen ink; some print on paper like ordinary bond paper while others require sensitized material. Yet each one is superior to the others in some respects.

Tools of the Office

Duplicating processes are used to make hundreds to thousands of copies at high speeds at relatively low cost per copy. The copies are made from some previously prepared master or stencil. The six processes listed here, gelatin, offset, relief, spirit, stencil and "special liquid," are designed for use in the office. In many cases, the same methods are used on a larger scale by commercial printing houses to print magazines, books, and other material.

Combinations of processes used

In recent years there has been a strong trend to make use of both copying and duplicating machines in offices, such as preparing a master or stencil for a duplicator on copying equipment.

In addition to pairing a copying process with a duplicating process, some copying equipment can be made to work with another copying process. Thus a photocopying machine can be used to prepare a translucent copy for a diazo machine.

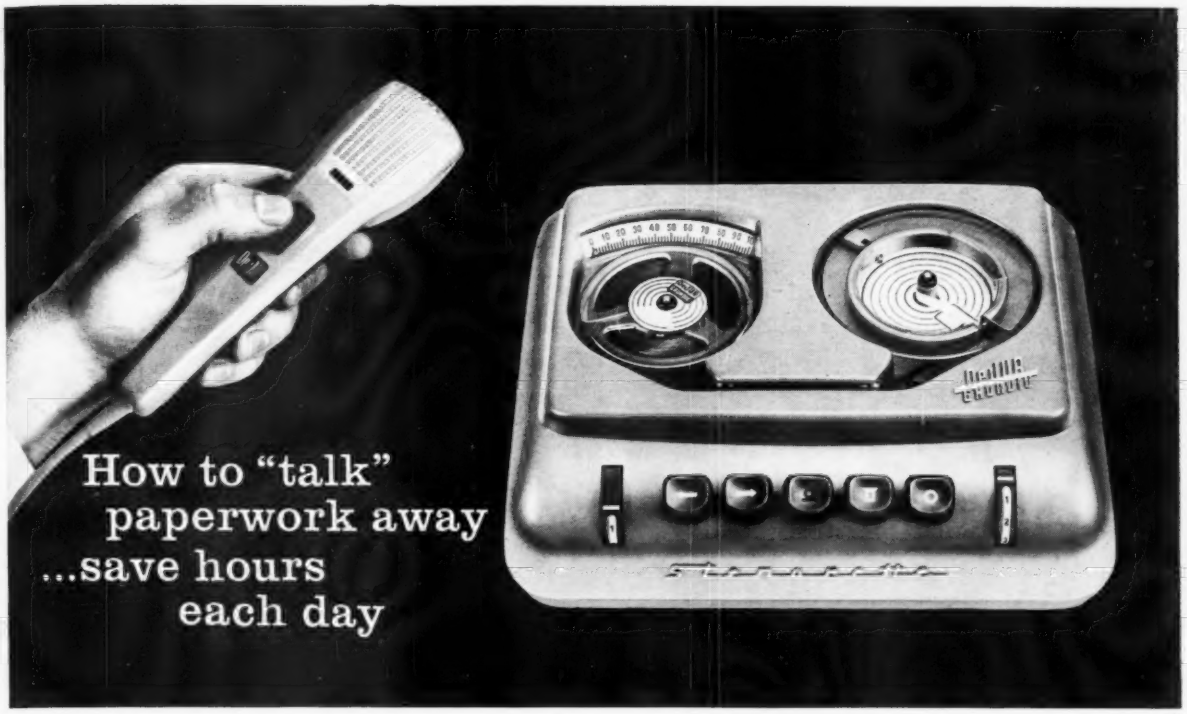
The individual characteristics of the different processes of both copying and duplicating equipment leave much room for systems analysis in making a selection of equipment. It is impossible to be sure of selecting proper equipment without knowing the special qualities of each of the copying and duplicating processes, to learn which machine offers the requirements which will suit an office's need. Some offer advantages of speed, some of quality appearance in the finished work, some of low cost, some of the ability to copy drawings, some of ease in operation by inexperienced personnel, some of the capacity to enlarge or reduce, some of the ability to print more than one color, and so on. Each process has its own particular uses and none is capable of performing all kinds of copying and duplicating operations.

Below are described the thirteen basic processes.

The Copying Processes

Diazo

The diazo process makes use of a dye formed by the combination of two chemicals. The equipment and papers used are so designed that these chemicals meet each other only in the areas where lines (such as those forming let-



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COMPARISON OF OFFICE COPYING AND DUPLICATING PROCESSES

COPYING PROCESSES. These processes are used to copy original material, including letters, art work, photographs, drawings, letterheads, etc. They are usually best suited for making from one to ten copies, but most can also prepare stencils or masters for one or more of the duplicating processes listed in the second half of this chart.

Process	Speed*	Cost Per Copy*	Can Process Enlarge or Reduce?	Duplicating Processes for Which Stencils or Masters Can Be Prepared	Characteristics of the Process
Diazo	200-800 copies per hour	about 1 cent	No	Offset	Copies are positives, in various possible colors. Translucent, one-sided originals required, or translucency must be made first. Process sensitive to most colors, less so to purples.
Facsimile	1 copy in 3 minutes	5 cents	No	Offset; Stencil; Gelatin; Spirit	Copies are positives on specially treated paper. Process is used widely for wire communications, is getting increased use for stencil cutting.
Photocopy	1 copy in 15 seconds —1 minute	4-9 cents	Most cannot	Offset; Stencil (in special units)	Copies are positives on white or colored coated paper; some units make negatives. Sensitive to wide range of colors. Can make translucencies for diazo process. Some units can make several prints from one negative.
Thermo-Fax	1 copy in 4 seconds	5 cents	No	None	Copies are positives on buff or colored paper having a wax-like finish which can be reinforced with heavier backing. Process less sensitive to some kinds of ink.
Verifax	1 copy in 50 seconds; 3 in 1 minute	9-10 cents (single); 2-4 cents (multiple)	No	Offset	Copies are positives on bond or similar non-sensitized paper. Several prints can be made from one matrix. Process is otherwise similar to photocopying.
Xerography	1 copy in 3 minutes	6 cents	Yes	Offset; Spirit	Copies are positives on various kinds of paper or film. Process is widely used to make offset masters. It is sensitive to wide range of colors. Can make translucencies for diazo process.

DUPLICATING PROCESSES. These processes are intended to make multiple copies at high speeds. A master, plate, or stencil must be prepared, or type must be set. Except for the relief process, masters and stencils can be prepared by typewriter, by hand, and by one or more of the copying processes listed above. Costs per copy vary greatly with the length of the run and the quality of materials used. Assuming a run of more than just a few copies, costs per copy are a fraction of a cent. Because of the wide variations possible within each process, no attempt is made to compare them costwise.

Process	Speed* (Copies Per Minute)	Length of Run for Which Best Suited**	Copying Processes Which Can Prepare Masters or Stencils	Characteristics of the Process
Gelatin (HECTOGRAPH)	10-75	10-100	Facsimile	Prints on paper with glossy finish. Best copies from purple carbon, but other colors can be used and can be run simultaneously. Copies become fainter as run continues.
Offset (MULTILITH; DAVIDSON)	75-150	10 to many thousands	Diazo; Facsimile; Photocopy; Verifax; Xerography	Copies are of high quality. Ink and paper color can be varied; one ink run at a time. Equipment requires reasonably experienced operator.
Relief (MULTIGRAPH)	40-100	300 to 100,000	None—type must be set	Copies resemble typing or printing, depending on whether ribbon is used. Process often used for "fill-in" items and work with changing copy, since type can be changed during run. Prints one color at a time on any color paper.
Special Liquid (AZOGRAPH; CHEMOGRAPH; TRANSOGRAPH)	40-120	10-125	None at present	These three processes perform like the spirit process, but feature "cleanliness"—printing dyes are not formed until paper enters machine, to avoid stain hazard. Printing color is approximately blue-black, varying with the process. Copies become fainter as run continues. Some machines can handle spirit process as well.
Spirit (LIQUID; FLUID; LIQUID HECTOGRAPH)	40-120	10-350	Facsimile; Xerography	Prints on paper with glossy finish. Variety of colors possible, but purple gives best results. Numerous colors can be run simultaneously. Copies become fainter as run continues.
Stencil (MIMEOGRAPH)	40-200	10 to 10,000	Facsimile; Photocopy (special units)	Copies are possible in any color ink on any color paper. Quick-drying inks permit use of bond and similar papers; other inks require rough paper. Some machines print more than one color simultaneously.

*Speed and copy costs are estimates for letter-size copies using materials of average quality and runs of average length. As circumstances vary, figures above or below those listed may be obtained. Speed figures allow not only for machine differences but for differences between manual and power operation.

**These figures do not represent machine limitations but are based on "practical" considerations such as cost, speed, method of operation, and other factors.

ters or lines in drawings) are to appear.

To accomplish this result, either of two methods may be used:

(1) The two chemicals may be incorporated in the sensitized coating of a sheet of copy paper, but are prevented from interacting by the presence of a "stabilizing" chemical. When this sheet of paper is exposed to light, one of the chemicals (a diazonium salt, or "diazo") is broken down so that it cannot combine with the other chemical (known as a "coupler"). Thus, if a sheet of paper containing written material is placed over the sensitized sheet and the two are exposed to an ultra-violet light, wherever light passes through the paper the copy sheet will be unable to show a dye.

However, the lines of the written material prevent light from passing through wherever those lines are to appear on the copy. The diazo is thus not broken down and it will later combine with the coupler to produce the dye.

In order to bring the chemicals together, the effect of the stabilizer must be cancelled, and this is done by bringing the exposed sheet into contact with an ammonia vapor. Once the stabilizer has been neutralized, the diazo reacts with the coupler to form the dye, making the final copy. This process is sometimes known as the "dry" process, but this term is misleading, inasmuch as it is used to apply to a variety of quite different processes.

Second method uses solution

(2) In the second method, only the diazo is contained in the coating of the sensitized sheet of copy paper. The sheet is exposed as in the first method, causing the diazo to break down where dye is not wanted. The sheet is then brought into contact with a liquid solution. This solution contains the coupler, and the dye-forming reaction proceeds as before to produce the final copy. Since a solution is used, this method was formerly referred to as the "wet" process. This term, however, is also misleading, for equipment using this method applies only a very light coating of solution to the copy paper, and enough heat is provided so that the copy emerges in a condition which is, for all practical purposes, dry.

Since light must pass *through* the original material, the diazo process does not copy two-sided or opaque originals directly. However, most office stationery is actually translucent enough to permit light to pass through it, and problems usually arise only when material has been written on both sides of the original.

In such cases, a translucent copy must first be made. This can be done in the diazo machine itself, depending on the particular type of machine and the supplies available. Alternatively, the translucent copy may be prepared by the photocopy, facsimile, or xerographic methods.

The final copies may be made on paper of several colors, and the color of the printing may itself be varied. Colors are chosen by means of an appropriate selection of copy paper. Sometimes five different colors may be obtained on a single print, but this requires the application by hand of special solutions.

Offset masters may also be prepared by the diazo process.

The process is most effective when original material is written in sharp lines with an opaque ink or pencil. Blue and purple inks, for example, are not usually as opaque as black inks and may not reproduce as well. While most typewriter ribbons make sufficiently opaque impressions, quality can be improved by typing with a sheet of carbon paper (especially a yellow or orange carbon) face up under the original. Some special purple pencils which allow the passage of light can be used to note items on an original which will *not* be copied.

When using the equipment, the operator may vary its speed to obtain optimum results. At excessively high speeds, copies will have dark backgrounds, while at lower speeds, the entire copy will tend to bleach out. The correct speeds may be estimated easily with a little experience.

Diazo equipment is designed for continuous feeding of copy. It does not normally copy pages from bound books, since the material to be copied is usually fed into the machine itself. It can copy art work, blueprints, drawings, letterheads, and other material. Some equipment can accept copy up to 54 in. wide. Whatever the width of the throat, the speed of advance may be varied, depending on the machine, from about 5 to 60 feet a minute.

Electrofax

The Electrofax process, which has been developed by the Radio Corporation of America, is used particularly for preparing offset and photoengraving printing plates.

A special Electrofax coating is applied to the plate. This coating has a photoconductive pigment. When it is to be used, it is given an electrostatic charge. The material to be copied is placed in a camera or equivalent and its image is projected onto the plate. (Contact exposure, using a positive or negative transparency, is also possible.)

The electrostatic charge on the plate is reduced by the effect of light on it, so that the image is reproduced invisibly on the plate in the form of electrical charges—the darkest lines retaining the highest charge.

The surface is then traversed by a magnetic brush which carries a resin powder. The powder is attracted to those areas where an electric charge remains, thus reproducing the original material. It is possible to produce negatives from positives, if desired.

The plate is then "fixed" by a few seconds' exposure to heat. The powder is thereby fused into a permanent image.

To make an offset plate, the surface is swabbed with a chemical which leaves the image receptive to greasy inks, while the background becomes receptive to water. Offset masters with a paper base, as well as metal plates, can be prepared in this manner.

The process permits the copying of all kinds of materials, including photographs, art work, typed, printed, and drawn material. It reproduces tonal gradations automatically.

"Arrow" diazo copying equipment is used as office systems machine. Picture courtesy of Peek & Harvey Mfg. Corp.

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Tools of the Office

Facsimile

The facsimile process is used for many purposes other than copying. It is used, for example, to connect the offices of telegraph companies with the offices of certain of their subscribers. Here it provides for the direct transmission and delivery of telegrams without the necessity for having them delivered by messenger. It is also used in other ways as a communications device.

However, a few models have been adapted for office use and these are used not only to prepare copies but to transfer original material to stencils or offset masters for high-speed duplication by the appropriate machines.

The process depends on a method of photoelectric scanning. The original material is wrapped around a rotating drum. The copy sheet is wrapped similarly about a second drum which rotates in synchronization with the first. As the original rotates, a narrow beam of light is reflected onto the paper in such a way that as the drum revolves, the light describes a spiral course from one end of the sheet to the other. This operation is carried on through a large number of rotations, so that every portion of the original is scanned in this manner.

The light beam is reflected into a photoelectric cell, where it generates a current corresponding in strength to the strength of the reflected light—which, in turn, depends on whether it is being reflected from a light or dark area. The current thus generated is used to produce a corresponding current in a stylus of the second machine which passes over the copy paper in synchronization with the original light beam. As the machine is designed, the current in the stylus is stronger as it passes over areas which should be dark—lines, letters, and so forth. The copy paper is sufficiently sensitive to this current that it is slightly burned by the electrical impulses. The degree of the burn varies with the strength of the current.

By this method, the dark areas of the original are transmitted electrically to the copy paper. The copying machine may be at a considerable distance from the one which produces the final copy, so that the process may be used for long distance communication as well as inter-office communication.

A modification of this process permits the stylus to be used to burn minute holes into a conventional stencil for use in a standard stencil duplicator. Thus, the process is employed to transfer art work (including photographs), drawings, letterheads, and other material—as well as written or typed matter—to stencils for subsequent high-speed duplication.

Used with the appropriate materials, the process can also copy material onto masters for gelatin, offset, and spirit duplicators.

Some new machines read copy in flat form. The material is scanned as it is fed through the machine, and the copy may be of indefinite length.

Photocopy

Photocopying is a modification of the principles of conventional photography for use in the office. It takes several forms:

(1) The "transfer" process is a contact method in which the original material is placed in direct contact with the sheet which makes the negative, and in which the negative, in turn, is placed in direct contact with the final positive copy sheet.

Usually, the original is placed face to face with a sheet of sensitized paper and exposed to light in a "printer." The light passes through the sensitized sheet and is reflected by the light areas on the original copy while the dark areas (the written lines) absorb the light and do not reflect it.

This light is reflected back onto the sensitized sheet, where it causes a reaction in the chemical coating of the paper, which is light-sensitive. The effect of light striking this coating is to alter it chemically so that it turns dark when it is developed.

Peerless Photo Products, Inc.'s DriStat "200" photocopier takes less space than a standard electric typewriter.

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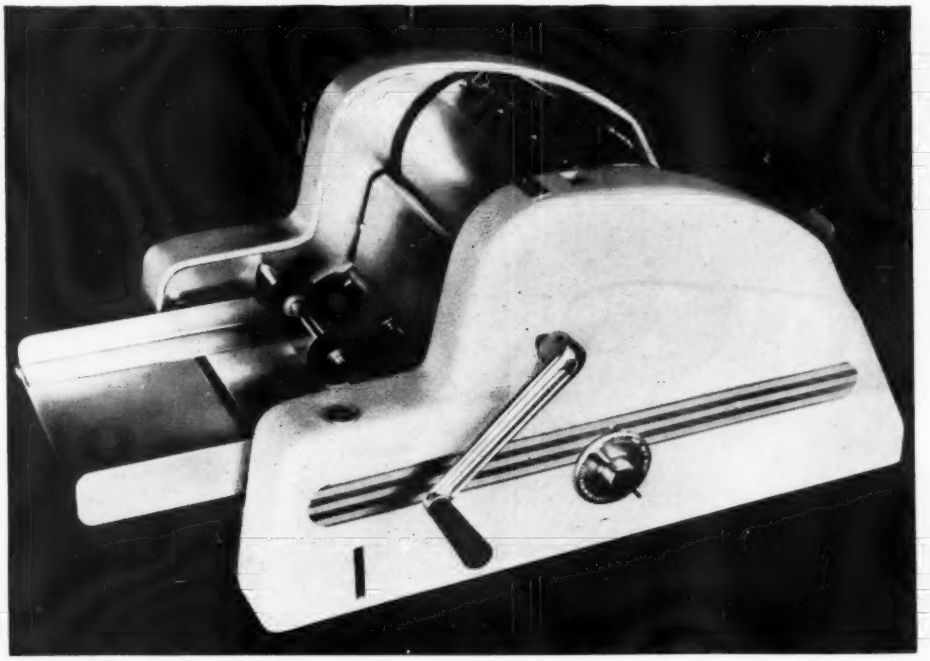

Old Town NEW Model 9H (manual) and 9E (electric). Each with automatic feed

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Q. Can I get perfect copies in a hurry?

A. *Definitely! Old Town's 9H and 9E employ spirit duplicating; do the job from composition to finished copies faster than any other process.*

Q. What about legibility?

A. *Finest! Clean, crisp and brilliant.*

Q. And versatility?

A. *Greater range of sizes (from 3" x 5" to 9" x 17") than any other spirit duplicators in their price range. Ability to use a wide variety of paper and card stocks.*

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This sheet, known as a negative, is removed from the printer (the original may then be returned to its original file or user) and placed face to face with another sensitized sheet. Both sheets are inserted into a developing unit where another chemical reaction takes place as the sheets pass through a solution. As a result of this reaction, the white areas of the negative produce corresponding dark areas on the final sheet, and these, of course, correspond exactly to the dark areas of the original. The sheets are left face to face for about fifteen seconds to complete the transfer. The sensitivity of the paper used is a factor, as is the strength of the light employed. However, since most office photocopiers are intended to be used in the open office, where the paper is exposed to some light, a relatively slow paper is used.

The transfer process is often referred to as the "dry" process. The term is somewhat misleading, for the copy sheet actually passes through a solution. However, the process is "dry" in comparison to conventional photographic development methods in which copies are saturated to a point requiring a drying period of several hours. Copies made by the transfer process emerge in a slightly damp condition but dry quickly.

A modification of photocopying, known as Verifax, is discussed separately, since it differs from standard photocopying in certain significant ways.

Developments offer diversity

One development in office photocopiers is the introduction of papers which permit two positive copies to be made from the same negative. It is expected that ultimately it will be possible to make several copies from one negative. Another development is the ability to make offset masters with the office photocopier. While photographic methods have long been used to make offset plates, the office photocopier has not been employed for this purpose until recently.

(2) The "autopositive" method allows making a final copy directly from the original without using an intermediate negative. To permit the copy to be read normally from left to right (a "right-reading" copy), it is necessary to place the original material face up over the sensitized sheet and to expose it to light passing through the original, rather than through the sensitized sheet. This method is known as the *direct* method, whereas the transfer process described above normally uses the face-to-face *reflex* method. The direct method can make right-reading copies in one step, of course, only when the original material is one-sided and sufficiently translucent to permit light to pass through it. If these requirements are not met, the original must usually be placed face to face with the sensitized sheet and exposed as in the transfer process. This produces, of course, a copy in which the printing is reversed, and a right-reading copy can be had only by repeating the process, using the copy as the new original.

However, in at least one case, right-reading positives may be produced from two-sided originals by placing the original face up *under* the sensitized paper, covering the coated side with a special sheet of semi-translucent plastic, and directing the light through the plastic and the copy paper to the original. The effect of the plastic is to shield the coating so that it is affected chemically only by light reflected back from the original.

(3) A standard copying camera may be used. This is not photocopying in its strictest sense, but rather a form of true photography. Use of a camera permits material to be enlarged or reduced. The process is considerably more elaborate, requiring more expensive equipment and more detailed processing.

Because a prism is normally used in the optical system to reverse the image received from the original material, office copying cameras of this type produce a right-reading image on the sensitized sheet. It is a negative, however, with white letters on a dark background; if a black-on-white copy is needed, the process can simply be repeated, using the first copy as the new original.

The developing process used requires passing prints through solution. As a result of the procedures required, prints emerge wet and must be allowed to dry before use. Units are provided on some machines for high-speed drying.

Photocopying, whatever the method, produces exact copies of originals. It is sensitive to almost all colors and gives excellent results. It may print final copies on colored paper or on transparent or translucent film. The latter may be used in diazo process equipment. Photocopy paper can be exposed in diazo equipment if a yellow filter is used, but it is then processed in a standard photocopy processing unit; the reflex method is used.

Most office photocopiers cannot copy pages from bound books, but some flat-bed models are available for the purpose.

Results may vary with the exposure used. The operator can learn easily, after a little experience, to gauge the exposure required, which varies with the type of original—adjustments having to be made for copy on papers of differing colors and differing degrees of intensity. Prints that are underexposed are generally too dark, while overexposed copies are usually bleached.

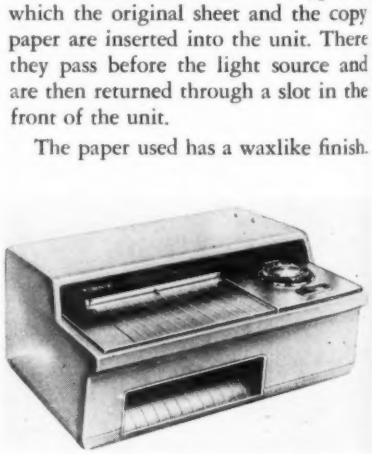
Thermo-Fax

The Thermo-Fax process operates on the principle that dark substances tend to absorb more heat than do light substances.

The paper on which copies are made is especially sensitive to heat and turns dark when exposed to it. A sheet of copy paper, which is translucent, is placed face up over the material to be copied and both are exposed in the copying unit to infra-red light. This light, on contacting the dark portions of the original material—i.e., the lines that make up the letters — generates heat, which, in turn, turns the copy paper dark in the corresponding locations, producing a copy of the original.

This is a simple method, requiring only one step. Machines using the principle are offered in the flat-bed type, which permits copying pages from bound material, and of the type in which the original sheet and the copy paper are inserted into the unit. There they pass before the light source and are then returned through a slot in the front of the unit.

The paper used has a waxlike finish.



Minnesota Mining & Mfg. Co.'s Thermo-Fax copying machine returns original and copy back to operator through front slot.

It is of light weight, but if heavier copies are required it can be reinforced by bonding it to an inexpensive back-up paper. This can be done in the machine itself.

The process is more sensitive to some inks than to others. In general, it picks up well any ink, pencil, or other deposit which readily absorbs heat, such as those inks with a carbon base. Ordinary pencil marks and standard typing and printing are easily copied. Some ball point and fountain pen inks, particularly those of a blue color, may not be picked up at all, but carbon-base inks record readily. Inks that do not record may be used to make indications on the original that are not desired on the copy.

The amount of exposure can be varied by reducing the time of exposure, thus varying the amount of light received. If the exposure is too prolonged, copies are too dark. On the other hand, too short an exposure produces a copy insufficiently dark. The exposure required for a given copy may be gauged easily by an operator after short experience.

Verifax

The Verifax process is an outgrowth of photocopying. However, it can make copies on non-sensitized paper, such as bond, and a number of copies can be made from a single negative. For these reasons it is considered separately from conventional photocopying.

The original material is placed face to face with a sheet of sensitized paper called a matrix, as in the reflex method of photocopying. These sheets are placed on the glass surface of the copying unit, and light passes through the copy paper to the original. The light areas of the original reflect this light to the matrix, while the dark areas absorb it and do not reflect it.

Wherever light strikes the matrix, a chemical reaction occurs. The matrix is removed from the unit and placed in an "activator" solution. As a result, the areas not reached by light during the exposure are changed into a dark dye-like substance, while the areas touched by light are "fixed." As the matrix is

For a quick index to the "Tools of the Office" section see page 72

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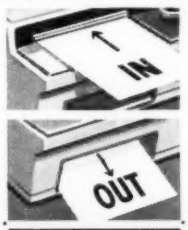

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removed from the solution, it is placed face to face with a sheet of non-sensitized copy paper and both are passed between squeegee rollers. (The copy paper does not itself pass through a solution.)

As a result of being pressed together, the dye-like substance is transferred to the copy sheet to produce the final copy. More than enough of this dye is produced to make one copy. In practice about five copies can be made from one matrix, and it is possible to obtain more, by making slightly lighter copies.

The Verifax method can copy opaque and two-sided originals by direct contact—without enlarging or reducing. It can copy art work, letterheads, and halftones if they are of not too fine a screen, and, of course, typed and written material.

Copies are black on white and can be made on card stock and on both sides of a sheet.

An accessory unit available for use with Verifax copiers can be used to make offset masters from the matrix in about one minute.

Since each copy taken from a matrix reduces the amount of dye on the matrix, each successive copy becomes weaker.

As with photocopying, overexposure produces dark copies, underexposure light copies. The correct exposure can be gauged easily after a little experience.

Xerography

The xerographic process operates on the familiar principle that unlike electrical charges attract each other, whereas like charges repel each other.

A copying camera is used to throw the image of material to be copied onto a plate which is coated and has been given a positive electrical charge. The action of the light is to cancel this charge. Thus the charge remains only in the areas corresponding to the dark areas of the original, and the image has, in effect, been written on the plate in the form of a positive electrical charge, which is, of course, invisible.

The plate is then placed in a developing tray, where a dark powder of resinous nature is passed over it. This powder has previously been given a negative electrical charge; consequently, it adheres to the charged portions of the plate, and the image becomes at once visible.

A sheet of paper, positively charged, is then placed over the plate, and as a result, a portion of the powder is drawn from the plate to the paper. The sheet is then placed in a "fuser" for a few seconds, where, as a result of heat, the powder is fused permanently into the paper.

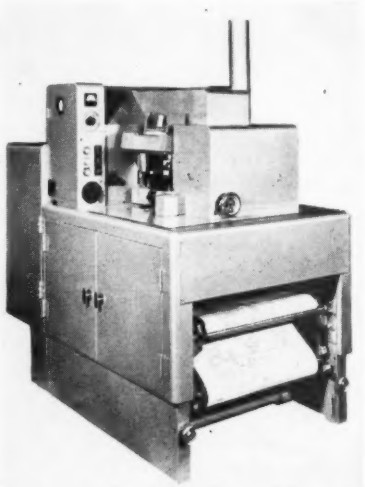
It is possible to obtain up to eight copies from the powder remaining on the plate after one exposure and one charge of powder. Among these may be a paper offset master.

The xerographic process can copy typed and handwritten material, drawings, art work, photographs, letterheads, etc. Some cameras permit enlarging and reducing. Copies are completely dry, and of high quality.

The process can be used to prepare paper offset masters; pre-sensitized, positive-working metal offset plates; spirit masters; and translucent copies for processing in diazo equipment.

While most copies are black on white, many different colors and weights of copy paper can be used.

New equipment employing the xerographic process includes "continuous" models in which the entire process continues automatically once the original material has been fed into the machine. High speeds can be attained.



The Haloid Co.'s XeroX Copyflo 24 Continuous Printer enlarges and prints from microfilm frames drawings of usable size.

The Duplicating Processes

Gelatin

The gelatin process is a variation on the spirit process. It is sometimes called the hectograph process (the spirit process being similarly called the liquid hectograph process).

Chemically, the two methods are very similar. Both use aniline dyes. Mechanically they differ. In the gelatin process, the master is prepared by typing or drawing with a hectograph carbon face down on the master, instead of face up beneath it. If a carbon is not used, the master may also be prepared by typing or drawing on it with a hectograph ink, crayon, or pencil. In any case, the written material appears as deposits of a dye.

Thus, the master, as prepared, is readily legible, the reading being arranged naturally from left to right.

But copies are not made directly from the master. The master, instead, is placed face down on a flat gelatin surface, and the dye is physically transferred to the gelatin. The image is thereby reversed.

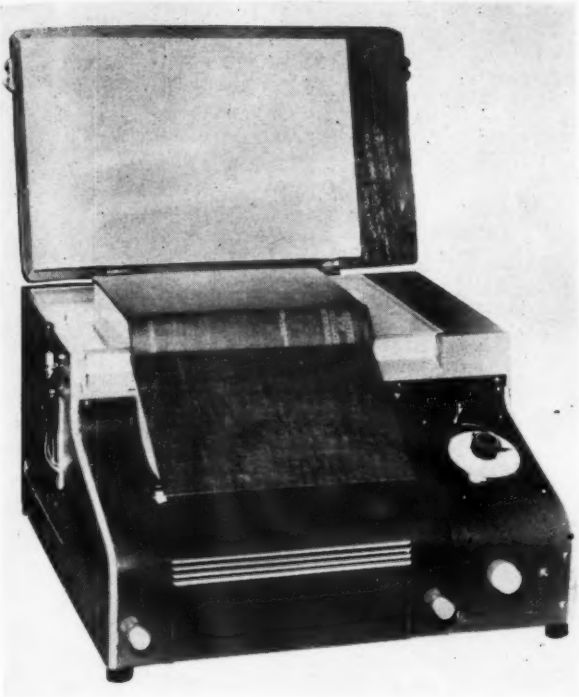
The gelatin may be placed in a flat-bed unit, or wrapped around the rotating drum of a duplicator. Whatever the method, copies are made from the gelatin, not from the master.

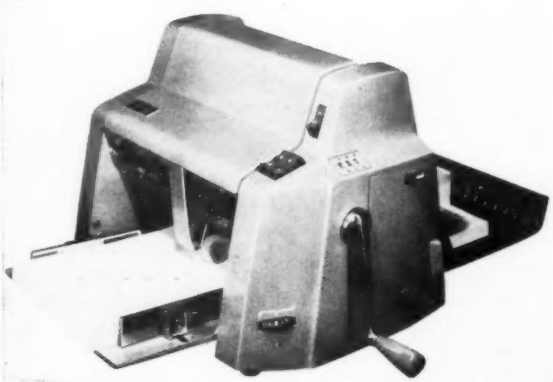
To make each copy, a sheet of copy paper is placed face down on the master. A portion of the dye adheres to it, creating the final copy. Each copy removes a thin layer of dye, leaving enough for the next copies. If the copies are not run at once, the dye will gradually sink into the gelatin, permitting the gelatin to be used over again, usually within 24 hours. The process may be repeated indefinitely.

As with the spirit method, copies are usually purple on white paper. However, carbons and special ribbons and pencils of various colors may be obtained, and these can be used in any desired combination on one master, permitting great variety. Purple, however, usually gives the longest runs with the strongest copies. The speed of operation depends on the type of machine and the operator.

The quality of copies depends on the clarity and evenness of the original typing or writing. The greater the amount of dye on the master, of course, the more copies can be made from it. The quality of the copy paper is also a factor, better results being obtained, naturally enough, from better paper. The gelatin surface should be slightly moist during the duplicating operation.

The gelatin used in a flat-bed machine is usually in roll form, so that it can be advanced to the next master at the end of a run, without having to wait until the particular master can be





Pictured above are three of the different models of duplicating and copying machines available. Top, Copease Corp.'s Book-Copier which permits copying from bound volumes. Middle, Remington Rand's Transcopy machine. Bottom, Bohn Duplicator Co.'s Rex Rotary M-4 Mimeograph duplicating machine.

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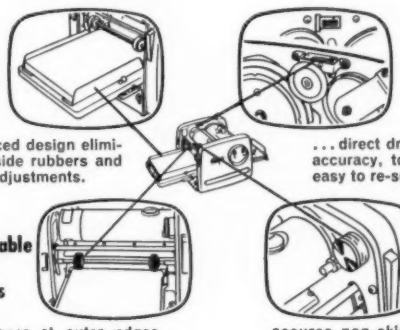

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. . . direct drive—greater accuracy, top visibility, easy to re-set.

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re-used. The gelatin is usually cloth-packed for purposes of reinforcement and ease of handling.

Offset

The offset process, as used in the office, is a modification (and simplification) of the familiar printing process known as photo-offset lithography. It is a little complicated to describe, but it turns out work of superior quality.

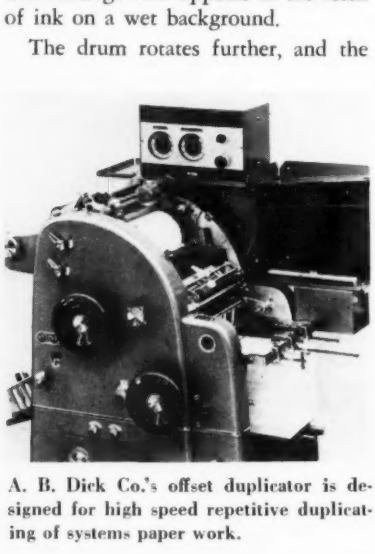
A master or plate is prepared. This may be of paper, plastic, or metal. Material is written or typed on it, appearing as deposits in the form of greasy lines. The master may be prepared on the typewriter, using an appropriate ribbon, or with any writing instrument which can make lines having the required greasy nature. Offset masters may also be prepared photographically, or by such other processes as xerography, photocopying, Verifax, diazo, and facsimile.

After preparation, the master or plate is placed around the rotating drum of the duplicator. It passes over two rollers as the drum rotates.

The first of these is moistened with water. Because of the nature of the plate and of the greasy line work on it, the water adheres to the bare parts of the plate but not to the lines. It may be said that the original message has now been written dry on a wet background.

As the drum continues to rotate, the master is brought into contact with the second roller, which is moistened with ink. This ink has a greasy nature and is therefore repelled by the water on the plate, but it adheres to the greasy lines. The message now appears in the form of ink on a wet background.

The drum rotates further, and the plate now passes into contact with a large cylinder covered with a rubber "blanket," and as the blanket comes into contact with the plate, the ink is transferred to the blanket.



A. B. Dick Co.'s offset duplicator is designed for high speed repetitive duplicating of systems paper work.

This complete cycle — moistening with water, moistening with ink, and printing on the rubber blanket cylinder —occurs each time the drum rotates.

But final copies have not yet been made. The copy paper is fed into the machine, one sheet for each rotation of the drum. As it is pressed against the blanket cylinder the ink is transferred to the paper.

This device of "offsetting" the ink from the master to the paper by means of the blanket cylinder (which gives the process its name) allows the image to be pressed firmly into the copy paper, making it possible to print halftones and other art work on rough paper without losing clarity to any important degree.

Work of high quality produced

The offset process produces work of high quality. Any number of printing colors may be used. The registration of the equipment is usually very exact, so that re-runs for additional colors are possible.

The equipment is admittedly more difficult to operate than most of the other duplicating types, and not a little operator skill is required. There have been a number of technical improvements in new machines, however, which have been intended to bring operation of the office offset duplicator within the reach of a relatively unskilled operator.

While masters are easily typed, care should be taken (as with all duplicating equipment) to see that the typing (or writing) is even and consistent. A heavily typed master may not print as well as one typed with a moderate touch, since heavy pressure may cause letters to "spread" or press the letters beyond reach of the ink roller, so that only their outlines will print. The touch should be firm but light — not enough to cause indentations — and typewriter keys should be clean. It is not necessary that the material typed on the master be easily readable for the master to be capable of turning out first rate copies.

Corrections on the master are easily made by erasing and typing over the error. However, care should be taken to use the proper kind of eraser — one that is not greasy, since it may leave traces that pick up ink from the ink roller. And erasures should not be deep, since damage to the master may cause it to pick up unwanted ink.

Relief

The relief process prints from embossed or raised letters. A familiar example is an ordinary rubber hand stamp. The typewriter itself uses the relief process. The embossed letters may be inked and used to print directly on the copy paper (as in the case of the stamp), or they may print (as in the case of the typewriter) through an inked ribbon.

Two methods of inking

Most office duplicators using the process, however, consist basically of a rotating drum which has channels into which movable type may be inserted, an ink supply, and a feeding mechanism by which paper can be inserted between the type and a roller. The type itself may be covered by a broad inked ribbon—which is the method used when the equipment is intended to produce copy that resembles typed material—or it may be inked by an ink roller before it comes into contact with the paper. Usually the same machine is capable of either method.

This type of equipment was long known as "multigraph." This term, however, which is owned by the Addressograph-Multigraph Corp., has in recent years been used to describe duplicating equipment made by that company without particular reference to the specific duplicating process used. The company describes this particular process by designating machines which use it as "Multigraph (Relief Process)" machines.

The type is set by hand into the channels of the drum. It may be changed at any time during a run, which gives the process particular versatility for use in preparing price lists and other material in which there are frequent changes. Rubber plates may be used in lieu of, or in addition to, the metal type, as well as slugs, electrotypes, signature plates, etc.

The process can turn out hundreds of thousands of copies if required. It is not an ideal process for very short runs, because of the labor involved in setting the type. However, once the type is set,

the cost per copy is extremely low, being a small fraction of a cent.

Special Liquid

The special liquid processes include the Azograph process (made by the A. B. Dick Co.), the Chemograph process (made by Ditto, Inc.) and the Transograph process (made by Columbia Ribbon & Carbon Mfg. Co., Inc.). The processes are designed to prepare copies by a method like standard spirit duplication without the disadvantage of the stain hazard.

The essential secret of all three methods, however, is in preventing the formation of the printing dyes until the master is placed on the duplicator and the copy paper is fed into the machine

In the case of Azograph and Chemograph, this is accomplished by separating two chemical agents so that they do not react to form a dye until they meet within the machine. The masters used are prepared by typing or drawing, with a special sheet (known as an Azograph transfer sheet or a Chemograph carbon respectively) placed face up underneath. These take the place of the conventional purple carbon used in the spirit process.

Method like spirit process

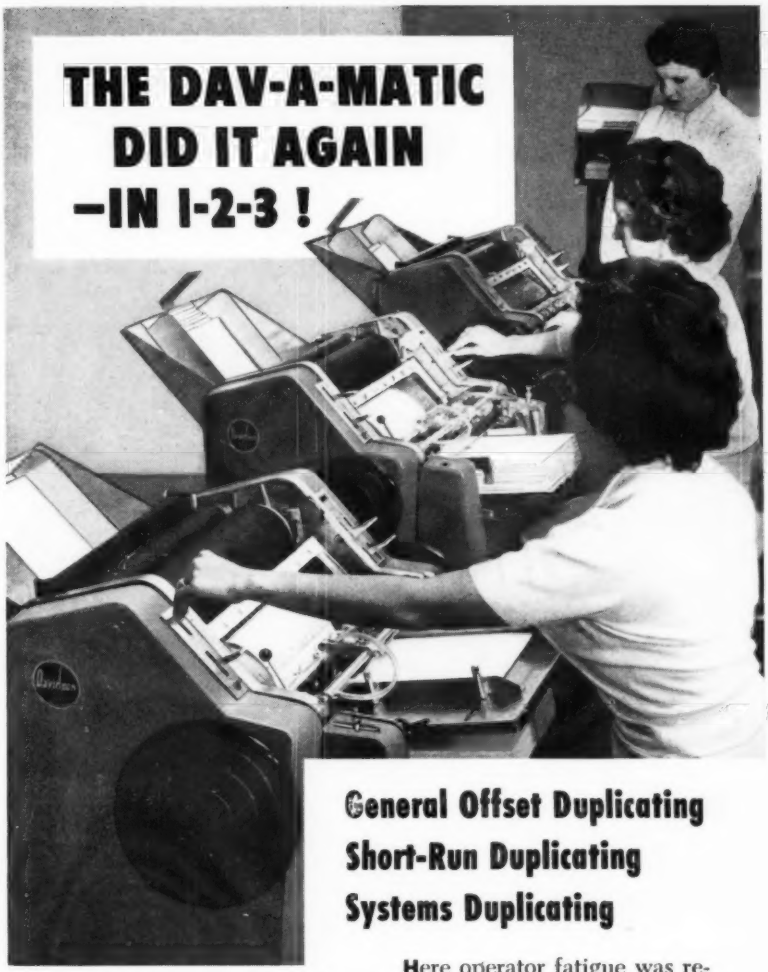
Mechanically the method is much like the spirit process. The master is wrapped around the rotating drum of the machine. But, as it is moistened, the chemical agents are exposed to each other, forming a printing dye. This dye then prints onto the paper, producing the final copies.

Transograph uses Transograph Tranfer Sets to prepare masters. This process also provides for the creation of printing dyes within the machine. These masters are available in a variety of forms, including continuous forms.

Thus, all three methods solve the staining problem by not exposing the dyes to the operator's touch.

These processes are essentially intended for the same type of work for which spirit duplication is used. In general, they sacrifice length of run for cleanliness of operation, it being considered that standard runs will not exceed 100 copies by any great margin. The Azograph process prints in blue, Chemograph in a deep blue-black, and Transograph in a deep shade resembling Chemograph.

As with the spirit process, copies be-



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come fainter as the run progresses and the quantity of dye on the master decreases. The equipment operates at speeds about comparable to those of the spirit process.

In many cases the same equipment may be used for both the spirit process and one of the new methods. Azograph duplicators, for example, handle the spirit process without alteration; older spirit duplicators, however, do not necessarily handle Azograph. A similar situation exists with respect to Chemograph. Ditto reports that its existing spirit duplicators are easily modified to handle Chemograph. Columbia states that existing spirit equipment is suitable for use with Transograph.

Spirit

The spirit process is sometimes called the liquid process, the fluid process, or the liquid hectograph process. Chemically it is practically identical to the gelatin process described above.

The master used is a sheet of carbon paper. In preparing it, a sheet of carbon paper is placed face up under it. Pressure from the writing instrument causes a portion of the dye to be transferred from the carbon to the back of the master, creating a reversed image of the material typed.

The master is then placed about the rotating drum of the duplicator. Each time it rotates, a sheet of copy paper enters the machine, slightly moistened as it enters by a solution containing alcohol. The alcohol serves as a solvent for the dye on the master, and as it comes into contact with it, it removes a thin layer of dye and transfers it by physical contact to the copy sheet, making the final copy.

Enough dye is deposited on the master when it is made to permit it to make several hundred copies.

Carbons in a number of different colors may be used in preparing the same master. As with the gelatin process, however, purple gives the best results, in terms of strength of copy lines and the number of copies that can be made.

Spirit duplicators are available in both manual and electric versions.

Speed affects quality

Varying the speed of operation can affect the quality of copies. At excessively slow speeds, for example, the solution on the paper may begin to dry before it touches the master, and copies will then be lighter. The darkness of copies can also be varied by changing the pressure of the roller which drives the paper against the master, and by increasing the flow of liquid.

Masters should be prepared with even typing, the keys being clean, or with even pressure when using a hard-pointed writing instrument such as a ball point pen. Erasures are made easily by scraping off faulty material with a dull blade or with the proper kind of eraser (but excess dye should always be scraped away before attempting to erase). Erasures may also be covered by applying a correction pencil, which covers the unwanted dye. New material may then be typed over the site of the error.

Stencil

The stencil process uses a true stencil for printing purposes. A stencil is a sheet of paper, plastic, metal, or other material, in which letters and numerals have been punched. Actual openings are formed, so that ink brushed on one side of the stencil may pass through to the copy paper on the other side, reproducing the pattern of the openings.

The typical office-type stencil is a wax-covered sheet of fibrous material. This fibrous base holds the centers of letters such as "o" in place even though the surroundings lines have been completely cut through. Actually, the lines are not punched completely through the waxy covering, but the fibrous base allows ink to pass through without interference.

Stencils are cut easily by typewriter or stylus, and may be prepared also by the facsimile and photocopy methods.

After the stencil has been cut, it is wrapped around the rotating drum of the duplicating machine. An ink supply is brushed against the stencil from within the drum, which is perforated, and as the drum rotates, the ink passes through the openings in the stencil to the copy paper, which feeds in as the drum revolves.

In another type of machine, known as the "twin-cylinder" type, the master is wrapped around two cylinders, which are covered by a silk screen. This type of machine uses ink in paste form, supplied in tubes.

One new development, called "Diagraphy," uses a dye-producing compound in lieu of conventional ink. The dye is not formed until the machine goes into operation. This method eliminates the customary stain hazard.

The stencil process can use inks of different colors. Usually only one color is printed at a time. The paper used is normally fairly rough, although with proper care (especially in slipsheeting) bond or offset paper can be used. If some of the newer fast-drying inks are used, copies can be made more easily on the better grades of paper.

Long runs possible

Good stencils may be capable of producing several thousand copies if properly made and handled. Using special stencils, much longer runs are possible. To obtain good copies it is essential to use care in cutting the stencil. The typewriter ribbon is not used, and the keys should be clean. Typing (or writing, if manual preparation is used) should be even and firm. When drawing on a stencil, heavy pressure may cause it to tear; broad lines may be obtained with a broad stylus.

Corrections are easily made with the aid of correction fluid, which fills in the lines of unwanted letters.

The sharpest copies are obtained from non-film stencils. Film stencils may be helpful in preventing a typist with a heavy touch from chopping out the centers of letters, and they are useful in preventing the type from becoming clogged with wax removed from the stencil. To make copy heavier — by broadening the lines — the typist may use a cushion sheet.

The Manufacturers

The following list includes the principal makers of office-type copying and duplicating equipment. Such devices as automatic typewriters and high-speed printers are included in more appropriate categories, such as *Typewriters* and *Integrated Data Processing Equipment.* Also see *Microfilm Equipment.*

The codes used in the list are as follows:

D—Diazo equipment.

E—Electrofax equipment.

F—Facsimile equipment, including models for stencil-cutting.

G—Gelatin equipment.

M—Microfilm equipment usable for making printed copies photographically.

MI—Miscellaneous.

NI – No information available at press time on current products.

O – Offset equipment of the office type.

P–Photocopy equipment.

R–Relief-type equipment.

SL – Special liquid process equipment, including Azograph, Chemograph, and Transograph.

SP–Spirit equipment.

ST–Stencil equipment.

T–Thermo-Fax equipment.

V–Verifax equipment.

X–Xerographic equipment.

Addo-X, Inc., 300 Park Ave., New York. (ST)

Addressograph-Multigraph Corp., 1200 Babbitt Rd., Cleveland 17. (O;R)

American Optical Co., Instrument Div., Buffalo 15, N. Y. (M)

American Photocopy Equipment Co., 1920 W. Peterson Ave., Chicago 26. (P)

American Tag Co., 6200 S. State St., Chicago 21. (R-NI)

Ampto, Inc., Newton, N. J. (Affiliate of Anken Film & Chemical Corp.) (P)

Autocopy, Inc., 12150 S. Peoria St., Chicago 43. (G-NI; SP-NI)

Bohn Duplicator Corp., 444 Fourth Ave., New York 16. (SP; ST)

Charles Bruning Co., Inc., 4700 W. Montrose Ave., Chicago 41. (D)

Burroughs Corp., 6071 Second Ave., Detroit 32. (M)

Columbia Ribbon & Carbon Mfg. Co., Inc., Herbhill Rd., Glen Cove, N.Y. (G; SL-NI)

Copease Corp., 425 Park Ave., New York 22. (P)

Copycat Corp., 41 Union Square West, New York 3. (D; P)

Copy-Craft, Inc., 105 Chambers St., New York 7. (P; SP)

Copy-Plus, Inc., 2817 W. Carmen Ave., New York 11. (P)

Cormac Photocopy Corp., 80 Fifth Ave., New York 11. (P)

Davidson Corp., 29 Ryerson St., Brooklyn 5, N. Y. (O; R)

A. B. Dick Co., 5700 W. Touhy Ave., Chicago 31. (O; P; SL; SP; ST)

Diebold, Inc., Flofilm Div., P. O. Box 127, Norwalk, Conn. (M)

Ditto, Inc., 6800 McCormick Rd., Chicago 45. (O; SL; SP)

Duophoto Corp., 236 Fifth Ave., New York 1. (O; P)

Duplicopy Co., 224 W. Illinois St., Chicago 10. (SP)

Du Prints, Inc., 1502 S. Main St., Los Angeles 15. (SP; ST)

Durst, USA, Inc., 770 Eleventh Ave., New York 10. (M)

Eastman Kodak Co., 343 State St., Rochester 4, N. Y. (V)

Electronic Communications, Inc., Air Associates Div., Teterboro, N. J. (F)

Filmsort, Div., Miehle-Goss-Dexter, Inc., 50 S. Pearl St., Pearl River, N. Y. (M)

Formfoto Mfg. Co., 3715 Milwaukee Ave., Chicago. (P-NI)

General Binding Corp., 1101 Skokie Hwy., Northbrook, Ill. (SP)

General Photo Products Co., Inc., 5 Summit Ave., Chatham, N. J. (P)

Gestetner Duplicator Corp., 216 Lake Ave., Yonkers, N. Y. (P; ST)

Graphic Duplicator Co., 6 Halstead Ave., Harrison, N. Y. (G-NI)

Griscombe Products, Inc., 133 W. 21 St., New York 11. (M)

Haloid Xerox Inc., 2-20 Haloid St., Rochester, N. Y. (M; X)

Milo Harding Co., 500 S. Monterey Pass Rd., Monterey Park, Calif. (MI—Tracing scopes—NI; ST)

Harris-Seybold Co., Div. of Harris-Intertype Corp., 4510 E. 71 St., Cleveland 5. (O)

Hart Mfg. Co., 2400 Endicott St., St. Paul 14. (SP-NI)

Hecto Products, Inc., 110 W. 17 St., New York 11. (G)

The Heyer Corp., 1850 S. Kostner Ave., Chicago 23. (G; SP; ST)

Hunter Photo-Copyist, Inc., 566 Spencer St., Syracuse, N. Y. (P)

Kenro Graphics, Inc., 25 Commerce St., Chatham, N. J. (O; MI—Process camera for offset negatives; P; X)

Keuffel & Esser Co., 300 Adams, Hoboken, N. J. (D—for microfilm enlargements)

A. Kimball Co., 444 Fourth Ave., New York 16. (R)

L & O Research & Development Corp., 134 N. Wayne Ave., Wayne, Pa. (F)

F. G. Ludwig, Inc., 66 Coulter St., Old Saybrook, Conn. (P)

Marr Duplicator Co., Inc., 53 Park Place, New York 7. (ST)

Master Addresser Co., 6500 W. Lake St., Minneapolis 16. (SP)

Microfilming Corp. of America, 2 Llewellyn Ave., Hawthorne, N. J. (D; P; X)

Microlex Corp., 1 Graves St., Rochester 14, N. Y. (M)

Minnesota Mining & Mfg. Co., 900 Bush Ave., St. Paul 6. (T)

The Multistamp Co., 527 W. 21 St., Norfolk 10, Va. (ST)

Old Town Corp., 345 Madison Ave., New York. (SP)

Ozalid, Div. of General Aniline & Film Corp., Johnson City, N. Y. (D)

Paragon-Revolute Corp., 77 South Ave., Rochester 4, N. Y. (D)

The C. F. Pease Co., 2601 W. Irving Park Rd., Chicago 18. (D)

Peck & Harvey, 5650 N. Western Ave., Chicago 45. (D)

Peerless Colonial Products, Inc., 200 N. Main St., Ivoryton, Conn. (D)

Peerless Photo Products, Inc., Shoreham, L. I., N. Y. (P)

Pekas Duplicator Co., Lock Box 306, Lesterville, S. D. (ST)

Pelprinter, Inc., 555 Central Ave., Orange, N. J. (D)

Photorapid of America, Inc., 320 Broadway, New York 7. (D: P)

Photostat Corp., P. O. Box 1970, Rochester, N. Y. (O; P—camera type; V)

Polychrome Corp., 2 Ashburton Ave., Yonkers 2, N. Y. (MI—Adapter to make offset masters from Verifax)

The Print-O-Matic Co., Inc., 724 W. Washington Blvd., Chicago 6. (MI—Diagraphy method using special "inkless" compound with stencils; ST)

Radio Corp. of America, Front & Cooper Sts., Camden, N. J. (E)

Recordak Corp., 415 Madison Ave., New York 22. (M; V)

Remington Rand, Div. of Sperry Rand Corp., 315 Fourth Ave., New York 10. (MI—Transcopy, Dexigraph, Plastiplate; P; ST)

Reproduction Products Co., 12790 Westwood Ave., Detroit 23. (D; MI-NI)

Rex-Rotary Distributing Corp., 387 Fourth Ave., New York 16. (F; SP; ST)

Robertson Photo-mechanix, Inc., 7440 Lawrence Ave., Chicago 31. (P)

Rovico, Inc., 318 Market St., Newark 2, N. J. (P)

Rutherford Duplicator Co., P.O. Box 13087, Houston 19. (ST)

S & M Distributing Co., Zip-O-Riter Products, 3875 Garland St., Wheat Ridge, Colo. (SP).

Speedliner Co., 4404 Ravenswood Ave., Chicago 40. (SP)

Speed-O-Matic Co., 760 W. Norton, Hollywood 46, Calif. (ST)

Speed-O-Print Corp., 1801 W. Larchmont Ave., Chicago 13. (ST)

Speed-O-Stat Corp., 236 Fifth Ave., New York 1. (P)

Standard Duplicating Machines Corp., 1935 Parkway, Everett 49, Mass. (SP)

Stewart-Warner Electronics, 1300 N. Kostner Ave., Chicago 51. (F)

Tecnifax Corp., Holyoke, Mass. (D; P)

Times Facsimile Corp., 540 W. 58 St., New York 19. (F)

Vari-Color Duplicator Co., 435 S. Lincoln St., Shawnee, Okla. (SP; ST)

Visirecord, Inc., Copiague, L. I., N.Y. (SP)

Weber Marking Systems, Div. of Weber Addressing Machine Co., Inc., 215 E. Prospect Ave., Mt. Prospect, Ill. (F; SP; ST)

Tools of the Office

The Western Union Telegraph Co., 60 Hudson St., New York 13. (F)

Whitin Machine Works, Whitinsville, Mass. (O)

Wolber Duplicator & Supply Co., 1201 Cortland St., Chicago 14. (SP; ST)

Filing Equipment and Office Safes

TODAY'S OFFICES are finding themselves with a heavier load of paperwork than ever before. With costs of personnel and floor space constantly rising, it becomes imperative to see that the records that must be kept are kept in the most efficient and compact way possible.

The subject of records management is a lengthy one. And depending upon the volume of papers and records that fall under its province, it can be an extremely complex study. The scope of this discussion, however, is limited to a review of filing and insulated storage equipment, including office safes, that is available to office administrators, who are the best determinants of the most efficient filing hardware for their particular needs.

Records classified by use

One way of classifying records to be stored is according to the frequency with which they are used. "Active" records, those which are consulted in the normal daily work routine, are usually kept in equipment which features convenient accessibility. "Inactive" records, of course, may be kept in less convenient locations as referral to them occurs less often.

Regardless of the "activity" of records, compactness of design of the equipment which houses them is most important, because floor space is so expensive.

One way to achieve a reduction of the volume of space actually needed to house a given volume of records is to reduce the space occupied by the equipment. The redesigning of conventional filing cabinets, chiefly by eliminating unnecessary space between drawers and between the tops of records and the tops of drawers, has made possible a five-drawer cabinet that occupies no more space than a conventional four-drawer unit. Expanding front file drawers also are beneficial as they allow a tighter packing of material in the drawers and when open still give enough room to locate material easily.

One space-saving advantage in storage of "inactive records" is the stacking ability of transfer cases. Sturdy wall units of these boxes may be built up to the ceiling if necessary.

Shelf filing and mobile storage installations are two other record housing methods that are particularly compact.

Basically, shelf filing consists of arranging file folders on open shelving, making the necessary adaptations in the indexing system so that material can be located conveniently. A number of models of shelving particularly designed for the purpose are on the market, equipped with index card holders, dividers or follower blocks, and if required, facilities for holding hanging folders. Standard shelving of suitable size, of course, can also be used.

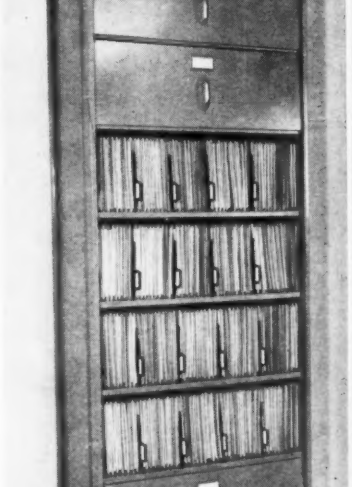
To eliminate the dust and fire hazard of shelf filing, units are now designed by some manufacturers so that the shelves may be completely housed in closed cabinets. The doors are usually hinged horizontally or otherwise mounted so that when open they are parallel to the floor. Some of these doors may be used as working surfaces when open and some types slide back out of the way. For semi-active records stored in shelf filing, special inexpensive clear wrappings are available to cover material.

Shelf filing compact

The great advantages of shelf filing are its high compactness and relatively low cost. Far less construction material is needed to enclose a given volume of records than is used in a conventional filing cabinet, and shelf units may be placed closer together than filing cabinets since it is not necessary to leave room in which to open drawers to maximum depths.

"Mobile storage" is another space saver. The principle of mobile storage consists of mounting storage units of any desired type, from shelving to transfer cases, so that they slide from side to side, riding either on tracks in the floor or suspended from overhead tracks. A row of units may be placed permanently against a back wall, while rows of tracks are installed in front of it. Mounting one or two fewer units on the tracks than there are units on the back row gives space to slide the units on the tracks to the side, so that there is access to the inner rows. Although the number of rows which can be mounted in such a way is theoretically unlimited, eliminating the factor of space, it is thought that three or four rows make the best workable arrangement since the more rows, the less convenient is the access to the files in the back. The last rows are perhaps, best suited to storage of relatively inactive records.

Another approach to reducing filing



Visi-Shelf File Inc.'s shelf filing unit includes doored shelves to be used for inactive records.

costs is to use the methods which will increase the speed of the use of files thus achieving greater labor and time savings.

Two of these methods are the visible and vertical-visible systems.

Convention filing is "vertical filing." "Vertical" filing does not mean that papers are stored in a position perpendicular to the floor level. The term was first applied to filing at a time when papers were usually stacked on shelves or in drawers, one above the other. Basically, it refers to files in which each paper is covered directly by the one above or in front of it. "Blind" filing perhaps would be a more appropriate term but is one which is less popular.

Edges of cards visible

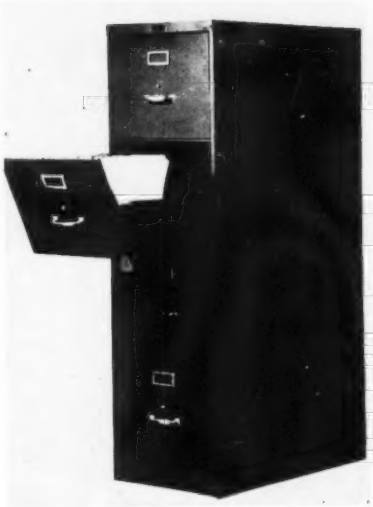
Visible types of filing are those in which one or more edges of the cards or papers are seen, permitting speed in locating and returning records to their proper place in the file. In some cases, the records are carried in pockets, often of transparent plastic or at least provided with a transparent margin. These may be mounted in flat drawers or slides, in books or in some similar arrangement. Loose leaf binders are also available for visible filing of material.

An adaptation of visible systems of filing is the vertical-visible method which has come to mean a type in which records (usually cards) are mounted in banks against large dividers in a type of tub file, with a side margin, and usually a top diagonal margin, visible. This principle, which allows extremely rapid access to filed material, as well as easy removal, is very well suited to machine accounting and similar applications. It is fairly bulky and expensive, but it is a cost saver in terms of the labor time it reduces.

Mechanized files save time

Another method which requires expensive equipment, but which greatly reduces labor time, involves the use of mechanized files. Most of these provide for some sort of rotary mechanism so that records can be brought to a seated worker, while records not in use are moved away.

Models vary in their particular features. In some, the cards are attached to a ring or other retaining device; in others they are carried about the circumference of a wheel or drum, being kept in place by retaining bands; in still others, they ride in trays which are designed to remain upright regardless



File cabinet features expanding drawer fronts for added filing space. Picture courtesy of Northwest Metal Products Co.

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other models — slightly higher

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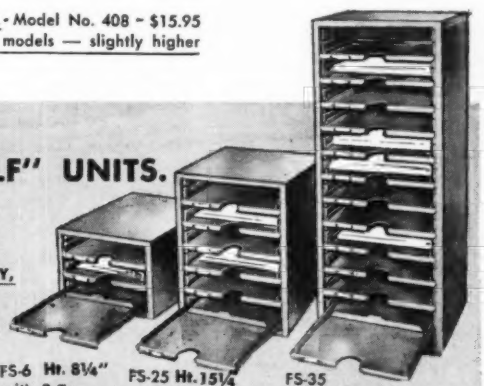

FS-6 Ht. 8¼" with 3 Trays Capacity (6 trays)

FS-25 Ht. 15¼" with 6 Trays Capacity (12 trays)

FS-35 with 12 Trays Ht. 30¼" Capacity (25 trays)

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of the position of the rotating mechanism.

Some models are manually operated but most use electrical power. A touch of a button or a flick of a dial bring a selected tray of cards (some trays employing the visible filing system) to desk level.

Rotary file model 40 for punched cards is designed for quick reference, ease of operation. Courtesy of Wright Line, Inc.

The speed of the work flow possible with mechanized and/or rotary files is an important factor to weigh against their increased cost over ordinary filing equipment.

Random filing is also beneficial in increasing the speed of information accessibility, but this has limited applications. The principle of random filing is based upon the idea that if a record can be placed in a number of different locations and still be found easily, much of the hunting time can be eliminated. An example of random filing is certain filing systems which use printed forms designed so that from one to ten records may be filed in any order behind a visible guide. The time gained from not having to replace the record in exact sequence justifies the rapid scanning of an average of five card records behind a guide. Some mechanized units use the random filing principle.

Fire protection important

Most filing equipment serves basically to store records in some reasonable order, providing comparatively little protection against fire and theft. However, as business becomes more aware of the fact that nearly half of those companies that lose their basic records in fires never resume operating, more attention is being concentrated on providing fire protection at the point of use in the office.

An increase is seen in the amount of "combination" equipment available. Such units are designed to permit individual workers to perform a variety of jobs relating to a given bookkeeping or accounting function without constant travel. They provide work space, a place for machines and housing space for the records used in connection with the job. Much of this equipment is insulated, on the principle that dangers from fire losses can be minimized if a maximum number of records can be housed in protected storage.

Office safes, therefore, are no longer the sole means of protecting valuable papers.

Because ordinary paper chars at temperatures of less than 400°F, and building fires often reach temperatures of 1,000° and even 2,000°F, it must be emphasized that placing records in ordinary steel cabinets does not afford proper protection. Even though the fire itself may never enter the closed cabinets, contents of non-insulated equipment may turn into ashes during a fire because the intense heat will cause cabinets to act as ovens.

Labels show fire resistance

Organizations such as the Underwriters' Laboratories, Inc., and the Safe Manufacturers National Association have classified storage equipment according to its ability to protect records

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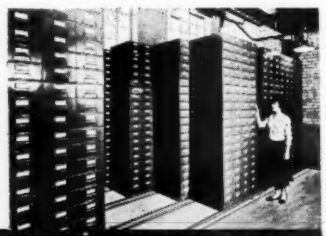

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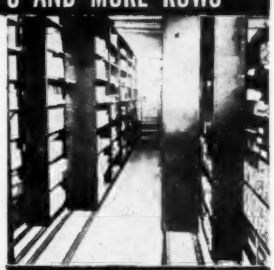

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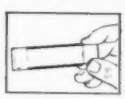

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Pressure-sensitive adhesion to any surface. Permanent or temporary labeling of shelves, boxes, bins, beds, telephones, desk trays, doors, drawers, racks, etc. Widths, 3/8", 1/2", 3/4" and 1". Labels retail for 30 cents for 6-inch length, usually cut to three 2" labels. Lengths up to 36" on special order. Plenty of inserts, to be written, typewritten or printed. Clear, Green, Blue, Red, Orange, Pink, Lemon, Amber.

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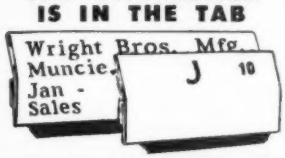
SEE YOUR SMEAD DEALER

Tell him about your specific filing problem. From the more than 4,000 Smead items available, he probably has the logical answer to your problem. If not, Smead can make it for him.

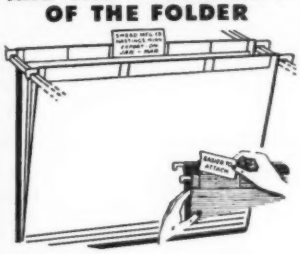
You are invited to write us for further information and literature on any of the items shown on this page.

FLEX-I-VISION Hanging Folders

THE DIFFERENCE IS IN THE TAB



AND THE VERSATILITY OF THE FOLDER



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1. LONGER WEAR
   All Metal Tabs
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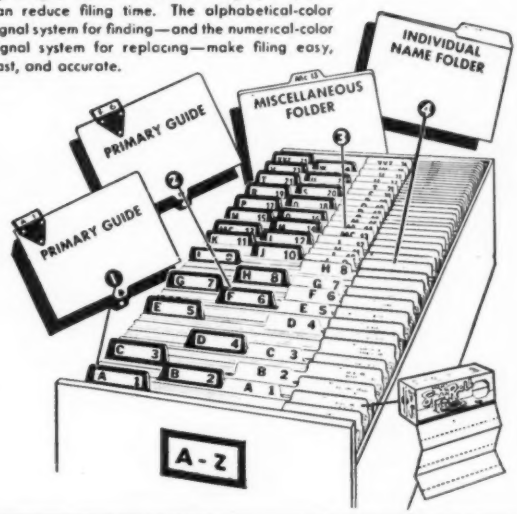
   Full 1" Exposure
3. SPEEDIER ATTACHMENT
   They Stay Put
4. A FOUR WAY FOLDER
   Front or Back Tabbing in 1/3 or 1/5 positions

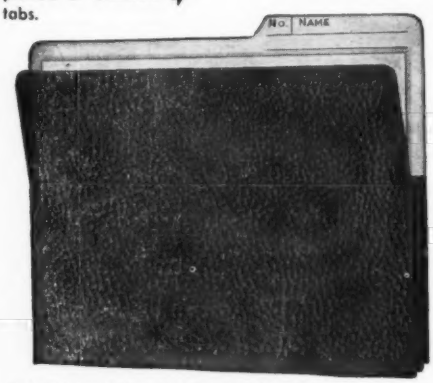
SMEAD'S TELL-I-VISION SYSTEM

By using Smead's Tell-I-Vision filing system, you can reduce filing time. The alphabetical-color signal system for finding—and the numerical-color signal system for replacing—make filing easy, fast, and accurate.



SMEAD'S PROPOSAL COVERS are furnished in many colors and finishes. Also available with open window.

SMEAD'S DESK FILE which is really a correspondence sorter. Available in printed or celluloid tabs.



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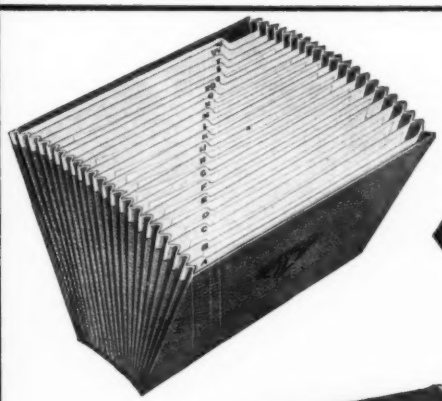
Designed for bulky material. Expansion up to 3½ inches. Ideal for important papers, contracts, etc.



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Perfect for carrying papers in all types of weather. Sheds water—glove-fitted whether partially or fully expanded. Furnished in four sizes.

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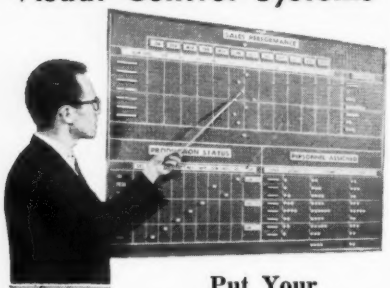

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The Maggie modern control system makes cards and pegs obsolete. Permanent magnetic indicators that can be moved with fingertip-ease make this control system completely flexible with limitless signalling and charting possibilities. You tailor it to your individual records. Cuts errors, clerical costs and raises efficiency. Low in cost, too, packaged kits begin at $49.50.

For further information write to:

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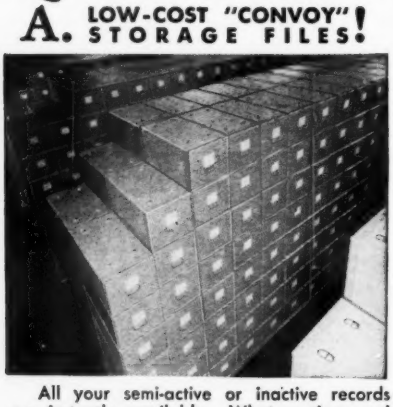
39 W. 32nd St., N.Y. 1, N.Y.

Q. GOT HIGH-PRICED HELP? LOOKING FOR RECORDS?
A. LOW-COST "CONVOY"! STORAGE FILES!



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Rigidized permanent Drawer and Shell construction eliminates shelving and costly searching (the biggest item).

All this at half the cost of steel because "CONVOYS" are heavy duty corrugated board processed to remarkable strength.

Sizes: letter, legal, check, deposit slip, tab card . . . 10 others.

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against heat by determining the requirements for various levels of protection. Corresponding labels have been issued which may be used by manufacturers whose products meet the requirements. The labels usually show for what specified length of time the temperature within the equipment will not exceed 350°F.

The *Class A Label* guarantees resistance to a four-hour fire reaching 2,000° throughout which time temperatures one inch from walls and door will not exceed 350°. It also indicates resistance to explosion from sudden heating and to impact from dropping.

The *Class B Label* indicates resistance to a two-hour fire reaching 1,850°, with temperatures one inch from walls or door not exceeding 350°. It also shows resistance to explosion from sudden heating and to impact after dropping.

The *Class C Label* shows a similar resistance (in terms of interior temperature) to one-hour fires reaching 1,700°, together with resistance to both explosion from sudden heating and impact.

The *Class D Label* indicates resistance to a one-hour fire reaching 1,700°, with temperatures not exceeding 350° in the center of the compartment, together with resistance to explosion from sudden heating.

The *Class E Label* indicates similar protection in half-hour fires reaching 1,550°.

These labels refer to safes as well as to other types of record protection equipment. Classes A, B and C labels are available on safes. Classes B and C labels on "insulated record containers," and Classes D and E labels on "insulated filing devices."

It is stressed by the Underwriters' Laboratories, Inc., that fire resistance "may be seriously impaired by disturbance or injury of the insulation material in a safe due to fire, burglary, or improper application of accessories."

Theft resistance limited

Most filing equipment has a very limited ability to resist theft, and the ability, whatever it may be, bears no direct relation to its fire-resistant qualities. Labels used with regard to theft generally indicate resistance to attacks of various types over specified periods of time.

Aside from the more expensive safes, labels used on most office equipment generally make no promise of protection against attack by explosives or oxy-fuel torches. "Tamper-resistant" doors are expected to provide resistance against tampering for a "limited time." According to the Underwriters' Laboratories, Inc., relocking devices "are intended to operate and relock the original boltwork or to relock the door by the functioning of auxiliary bolts in the event of a burglarious attack upon the door."

The cost of providing truly adequate fire and theft protection for all of a company's records is often prohibitive. But it is essential that all of the company's vital records be protected because of the high percentage of those companies that never resume operating after losing their basic records in fires.

We should also like to state at this point that a wide variety of miscellaneous filing equipment is offered on the market to house many different types of records such as blueprints and tape reels, so that today's record storage equipment problem is one of selection rather than one of availability.

The Manufacturers

The following list includes the major manufacturers of various types of filing and record storage equipment. See also the list, which follows it immediately, covering office safes and certain types of "point-of-use" record protection equipment.

The code symbols used in the list are as follows:

FC—Filing cabinets.

MI—Miscellaneous.

MS—Mobile storage installations in which storage units ride on tracks mounted on the floor or suspended from above.

NI—No information available at press time on current products.

RM—Rotary and mechanized files and similar equipment.

SH—Shelf filing equipment, including open- and closed-shelf types.

TC—Transfer cases.

VB—Visible record equipment, binder type.

VC—Visible record equipment, card

For a quick index to the "Tools of the Office" section see page 72

tray type. (Includes book-type modifications.)

VV—Visible record equipment, "vertical visible" type.

Ace Looseleaf Corp., 27 Bleecker St., New York 12. (VB-NI)

Acme Visible Records, Inc., Crozet, Va. (FC; MI; RM; VC; VV)

The Acorn Co., 4605 W. 21 St., Chicago 50. (FC-NI; TC-NI)

All-Steel Equipment Inc., 100 Griffith Ave., Aurora, Ill. (FC)

Amberg File & Index Co., 1627 E. Duane Blvd., Kanakee, Ill. (MI-portable file boxes)

American Box & Paper Co., 6-18 Mangum St., P.O. Box 4033, Atlanta 2, Ga. (TC)

American Metal Products Corp., 3864 Laclede Ave., St. Louis 8. (FC-NI)

Art Metal Construction Co., Jones & Gifford Aves., Jamestown, N. Y. (SH; VB; VC)

Art Steel Co., Inc., 170 W. 233 St., New York 63. (FC-NI; MI-Blueprint files-NI; VB-NI; VC-NI; VV-NI)

Atlantic Microfilm Corp., 28 Railroad Ave., Pearl River, N. Y. (MI-microfilm files)

Atlas Stencil Files Corp., 16716 Westfield Ave., Cleveland 10. (MI-Cabinets for offset plates, stencils, etc.)

Automatic File & Index Co., 549 W. Washington Blvd., Chicago 6. (FC-NI; TC-NI; V-NI)

Aurora Equipment Co., Equipto Div., 401 South Highland, Aurora, Ill. (SH)

Badger, Inc., King & Front Sts., La Crosse, Wis. (MI-Portable filing equipment)

Bankers Box Co., 2607 N. 25 Ave., Franklin Park, Ill. (TC)

The Bentson Mfg. Co., 652 N. Highland Ave., Aurora, Ill. (FC)

Blair Aluminum Furniture Co., 106 Kennesaw Ave., Marietta, Ga. (FC)

Borroughs Mfg. Co., 3002 N.Burdick, Kalamazoo, Mich. (SH)

Browne-Morse Co., Muskegon, Mich. (FC)

Business Efficiency Aids, 8114 N. Lawndale Ave., Skokie, Ill. (MI-Visible records using magnetism to separate cards)

Carteret Printing Co., 480 Canal St., New York 13. (VB; VC)

Cel-U-Dex Corp. P.O. Box 1127, Newburgh, N. Y. (MI-Drawer dividers; SH)

Challenger Steel Products Corp., 350 Morgan Ave., Brooklyn 6, N. Y. (FC-NI)

Cole Steel Equipment Co., Inc., 415 Madison Ave., New York 17. (FC; SH; TC; VC; VV)

Columbia Steel Equipment Co., Fort Washington, Pa. (FC-NI; MI-NI)

Convoy, Inc., 3424 Navarre Rd., S.W., Canton 6, Ohio. (TC)

Cooks', Inc., 207 Lakeview Ave., N.E., Blackwood, N. J. (VB-NI)

Visible record cabinet has twelve drawers for 5- by 8-in. cards. Picture courtesy of Globe-Wernicke Co.

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Smith's
OPNWINDO®
Metal Tabs
solve filing problems at
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Adjustable OPNWINDO® metal tabs make it easy, economical to expand or revise your present filing system; start a new system; or convert to shelf filing. Available in 1 and 2 inch widths, the tabs are complete with clear or colored plastic label covers.

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FILE FOLDER LABELS

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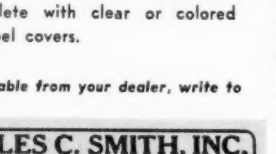
Stick Without Moistening!



No fuss—no muss, when you label the Able-Stik pressure-sensitive way. Just peel 'n press—they go on at the touch of a finger. Color coded—blue, green, red, yellow. Important—you can peel 'em off the folders so that folders can be reused. Use them also to stick to file cabinets, parts bins, shelf edges, desk trays, etc. Label size ½" x 3½". 10 to a fanfolded strip. Insert strip and type. Have guide spots for typing. No machine adjustments necessary. Order trial quantity today!

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Tools of the Office

Corry-Jamestown Mfg. Corp., 44 N. Center St., Corry, Pa. (FC; TC)

Currier Mfg. Co., 2488 W. Larpenteur, St. Paul, Minn. (FC; MI; SH; VC; VV)

DeLuxe Metal Furniture Co., 243 Struthers St., Warren, Pa. (SH)

Diebold, Inc., 2011 Mulberry Rd., Canton 2, Ohio. (FC; RM; SH; TC; VB; VC; VV)

Dolin Metal Products, Inc., 315 Lexington Ave., Brooklyn 16, N. Y. (MI-Tab card boxes; MS; SH; TC)

Dresser Products Inc., P.O. Box 2035, Providence 5, R. I. (MI-Files for coded tapes; RM)

Dunbar Furniture Corp. of Indiana, Berne, Ind. (FC)

Durable Metal Products Co., 1709 St. Marks Ave., Brooklyn 33, N. Y. (FC-NI; MI-Roller files-NI)

Elbe File & Binder Co., Inc., 649 Alden St., Fall River, Mass. (MI-Binder filing devices; VB)

Electrofile Div., Johnson Fare Box Co., 4619 Ravenswood Ave., Chicago 40. (RM-NI)

Estey Corp., 350 Broadway, New York 13. (SH)

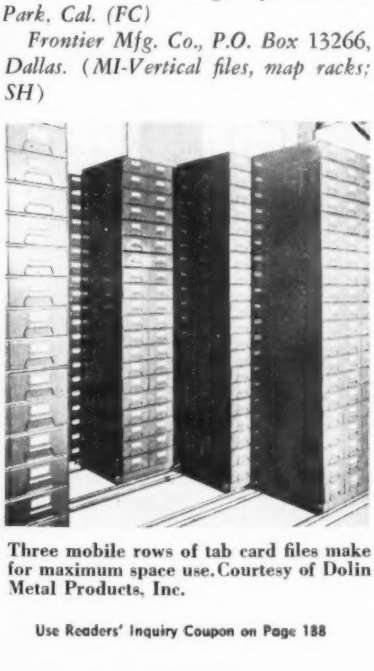
Evans Specialty Co., Inc., 1800 E. Grace St., Richmond, Va. (VC)

The Federal Equipment Co., P.O. Box 446, Carlisle, Pa. (MI-Filing cases-NI)

Ferris Business Equipment, Inc., 45 Seymour St., Stratford, Conn. (MI-Tub files for cards-NI; RM-NI)

Fortress Steel Furniture Mfg. Co., 15531 E. Arrow Highway, Baldwin Park, Cal. (FC)

Frontier Mfg. Co., P.O. Box 13266, Dallas. (MI-Vertical files, map racks; SH)



Three mobile rows of tab card files make for maximum space use. Courtesy of Dolin Metal Products, Inc.

The General Fireproofing Co., 413 Dennick Ave., Youngstown 1, Ohio. (FC; RM; TC; SH; VV)

General Steel Products Corp., Flushing 55, N. Y. (MS-NI; SH-NI; VV-NI)

The Globe-Wernicke Co., Norwood, Cincinnati 12. (FC; MI-Desk-side files; SH; TC; VC)

Guide System & Supply Co., Inc., 335 Canal St., New York 13. (TC)

The H-O-N Co., Third & Oak Sts., Muscatine, Iowa. (FC; TC; VC; VV)

The Hahn Co., Box 64532, Los Angeles 64. (MI-Portable card files)

Hamilton Mfg. Co., Two Rivers, Wis. (MI-Units for drafting equipment-NI)

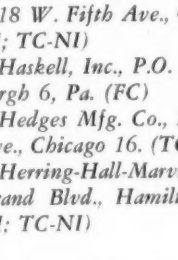
The Hamilton-Skotch Corp., Hamilton, Ohio. (MI-Portable check files)

Harrison Steel Desk & File Co., 4718 W. Fifth Ave., Chicago 44. (FC-NI; TC-NI)

Haskell, Inc., P.O. Box 5273, Pittsburgh 6, Pa. (FC)

Hedges Mfg. Co., 2931 Wentworth Ave., Chicago 16. (TC-NI)

Herring-Hall-Marvin Safe Co., 1550 Grand Blvd., Hamilton, Ohio. (RM-NI; TC-NI)



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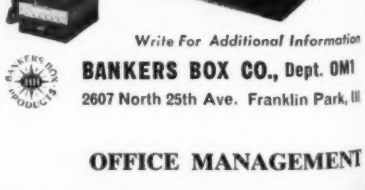

Write For Additional Information
BANKERS BOX CO., Dept. OM1
2607 North 25th Ave. Franklin Park, Ill.

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Hillside Metal Products, Inc., 262-270 Passaic St., Newark 4, N. J. (FC)

The Interior Steel Equipment Co., 2352 E. 69 St., Cleveland 4. (TC-NI)

Invincible Metal Furniture Co., 26 & Franklin Sts., Manitowoc, Wis. (FC)

Jasin Mfg. Co., U.S. 31 at Michigan Ave., South Haven, Mich. (SH-NI)

Jayem Sales Corp., 31 Coffey St., Brooklyn 31, N. Y. (FC; MI-Personal files; RM; TC; VC)

Kay-Wood Products, Inc., Drawer 361, Bedford, Pa. (FC; TC)

Le Febure Corp., 716 Oakland Rd., N.E., Cedar Rapids, Iowa. (FC; RM; VB; VC; VV)

Lit-Ning Products Co., 3907 Duquesne Ave., Culver City, Calif. (MI-Hanging folder units-NI; SH-NI)

Logan Business Products, Inc., Vue-Fax Div., Westbury, N. Y. (VV-NI)

Lyon Metal Products, Inc., Aurora, Ill. (SH)

Master Products & Mfg. Co., 3480 E. 14 St., Los Angeles 23. (SH-NI; VV-NI)

Master-Craft Corp., Div., of The Shaw-Walker Co., 831 Cobb Ave., Kalamazoo, Mich. (VB-NI)

The Mayfair Co., 315 N. Desplaines St., Chicago 6. (TC-NI)

The McBee Co., Smith St., Athens, Ohio. (MI-Binders for marginally punched forms-NI)

McMillan Book Co., 701 E. Genessee St., Syracuse, N. Y. (VB-NI)

Metalstand Co., 7520 State Rd., Philadelphia 35, Pa. (FC)

Midwest Metal Mfg. Co., 1818 N. 18 St., St. Louis 6. (FC-NI)

Mim-E-O Stencil Files Co., 886 N. Milwaukee Ave., Chicago 22. (MI-Stencil filing units-NI)

Mobile Racks, Inc., 369 Lexington Ave., New York 17. (MS-NI)

Momar Industries, 4323 W. 32 St., Chicago 23. (MI-Filing racks for blueprints; SH)

Monarch Metal Products, Inc., New Windsor, Newburgh, N. Y. (SH)

Moore Business Forms, Inc., Niagara Falls, N. Y. (MI-Filing cabinets for accounts receivable-NI)

The Mosler Safe Co., 320 Fifth Ave., New York. (MI-File drawers; RM)

Ray Myers Corp., Endicott, N. Y. (FC; MI; VC)

National Blank Book Co., P.O. Box 791, Holyoke, Mass. (VB; VC; VV)

Norfield Methods & Procedures, Inc., 933 S. Clinton Ave., Oak Park, Ill. (VB)

Northwest Metal Prod. Co., 1337 E. Mason St., Green Bay, Wis. (FC)

Tools of the Office

Office Equipment Mfg. Co., Inc., 2208 Summer St., Dallas. (TC)

Oxford Filing Supply Co., Inc., Clinton Rd., Garden City, N. Y. (MI-Hanging folders, mobile desk-side filing cabinets, desk drawers; TC)

The Paige Co., 114 E. 32 St., New York 16. (TC)

Parker Steel Products, Inc., 54 N. 11 St., Brooklyn 11, N. Y. (TC-NI)

Peerless Steel Equipment Co., 6600 Hasbrook Ave., Philadelphia 1. (FC-NI)

Penn Metal Corp. of Pa., 50 Oregon Ave., Philadelphia. (FC-NI)

Plan Hold Corp., 5204 Chakemco St., South Gate, Calif. (MS; VV)

Pronto File Corp., 415 Madison Ave., New York 17. (TC-NI)

Ramsey Co., 106 S. Seventh St., Philadelphia 6. (MS-NI; SH-NI)

Record Files, Inc., P.O. Box 581, Wooster, Ohio. (SH; TC)

Recordak Corp., 415 Madison Ave., New York 17. (MI-Microfilm cabinets)

The Recordplate Co., 130 N. Fair Oaks Ave., Pasadena, Calif. (MI-Portable loose-leaf visible equipment; VB)

Remington Rand, Div. of Sperry-Rand Corp., 315 Fourth Ave., New York 10. (FC; MS; RM; SH; TC; VB; VC; VV)

Republic Steel Corp., Berger Div., 1038 Belden Ave., N.E., Canton 5, Ohio. (FC; TC)

Royal McBee Corp., Westchester Ave., Port Chester, N. Y. (MI-Units to house firm's Keysort equipment)

Royal Metal Mfg. Co., 1 Park Ave., New York 16. (SH)

General Fireproofing Co.'s Double Acting Super-Carder unit permits several workers to use equipment at same time.

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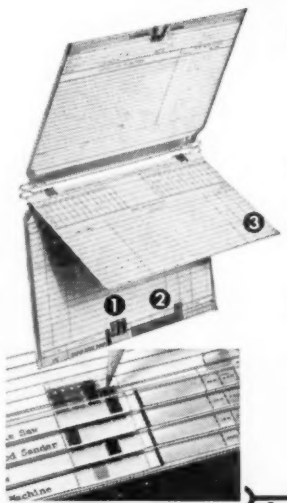
Preventive Maintenance Record Systems

CUT "DOWN" TIME



❶ **ONCE A WEEK** Lock-in chain signals, with 4 windows, each a different color, show the week inspection is to be made. With both month and week signalled, you avoid missing semi-monthly inspections or those requiring more frequent attention.

❷ **ONCE A MONTH** Progressive signals, always visible, show the inspection schedule. Colors designate type of work to be done. When work is completed and entered on record card, signal is advanced to month next inspection is due.

❸ Acme hinged pockets and the two cards on one hanger feature, is ideal for follow-up control. Each machine and motor is listed on an individual card placed in the back of pocket—in facing pocket a "History of Repairs," with signals *always visible*, indicate next inspection or lubrication date—"Spare Part in Stock" record card is hung on the same hanger as "History of Repairs" card.

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CROZET, VIRGINIA

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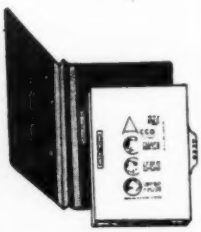

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(for marginal multiple punched forms)

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and other filing supplies

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Tools of the Office

S-K Forms Co., 1907 Chestnut St., Philadelphia 3. (MI-File folders)

Security Steel Equipment Corp., Avenel, N. J. (FC; MI-Microfilm cabinets)

Sedgwick Equipment Corp., 80 Eighth Ave., New York 11. (MS-NI; SH-NI)

The Shaw-Walker Co., Muskegon, Mich. (FC; TC; VB; VC; VV)

The C. E. Sheppard Co., 44-01 21 St., Long Island City 1, N. Y. (VB)

Speed-O-Print Corp., 1801 W. Larchmont Ave., Chicago 13. (MI-Stencil filing cabinets)

Stacor Equipment Co., 768 E. New York Ave., Brooklyn 3, N. Y. (MI-Blueprint files-NI)

Standard Pressed Steel Co., Columbia-Hallowell Div., Box 919, Jenkintown, Pa. (FC)

Stationers Loose Leaf Co., 246 E. Chicago St., Milwaukee 1. (VB)

Steel Furniture Mfg. Co., 15531 Arrow Highway, Baldwin Park, Calif. (FC-NI)

Steelcase, Inc., 1491 Division Ave., S., Grand Rapids 2, Mich. (FC-NI; SH-NI)

Steel-Parts Mfg. Co., 4630 W. Harrison St., Chicago 44. (MI-Portable units-NI)

Stow & Davis Furniture Co., 25 Summer St., N.W., Grand Rapids 2, Mich. (FC)

Strayer Coin Bag Co., Inc., New Brighton Pa. (TC-NI)

Supreme Steel Equipment Corp., 53 St. & First Ave., Brooklyn 32, N. Y. (TC; SH-NI)

Systems Sales Co., P.O. Box 343, Binghamton, N. Y. (MI-Tab card cabinets-NI; TC-NI)

Tab Products Co., 995 Market St., San Francisco 3. (SH)

Todd-Hadley Div., Burroughs Corp., 6071 Second Ave., Detroit 32. (VV-NI)

Top Flight Products Co., Inc., 6224 S. Oakley Ave., Chicago 36. (MI-Single-drawer hanging files-NI)

The Victor Safe & Equipment Co., Inc., 315 Fourth Ave., New York 10. (FC;VC)

Virginia Metal Products, Inc., Orange, Va. (SH-NI)

Visirecord, Inc., Copiague, L.I.,N.Y. (VV-Including portable units-NI)

Visi-Shelf File, Inc., 225 Broadway, New York 7. (SH)

Vue-Fax Corp., 655 Main St., West-Bury, N. Y. (VV-NI)

Wassell Organization, Inc., Sylvan Ave., Westport, Conn. (RM-NI; VC-NI; VV-NI)

Watson Mfg. Co., Inc., 63 Taylor St., Jamestown, N. Y. (FC; SH; VC)

Watt & Gillogly, Inc., 7 S. Dearborn St., Chicago 3. (MI-Binders for bookkeeping and accounting forms-NI)

The Weis Mfg. Co., Box 600, Monroe, Mich. (TC-NI)

Western Mfg. Co., 536 N. Highland Ave., Auroro, Ill. (FC)

Wheeldex & Simpla Products, Inc., 1000 N. Division St., Peekskill, N. Y. (MI-Portable card index file; RM)

Wilson Jones Co., 209 S. Jefferson St., Chicago 6. (TC; VB)

The Wright Line, Inc., 160 Gold Star Blvd., Worcester 6, Mass. (MI-Punched card files; RM)

Yawman & Erbe Mfg. Co., 1099 Jay St., Rochester 3, N. Y. (FC; MI-Side-filing units; TC; VC; VV)

York Safe & Lock, Mulberry Rd., Canton 2, Ohio. (SH)

Zephyr American Corp., 95 Morton St., New York 14. (RM)

Office Safes and Insulated Record Protection Equipment

The following list covers the major manufacturers of safes and record protection equipment. The types of equipment offered by each company are indicated by the following codes:

FC—Insulated filing cabinet. Information on label classification not available at press time.

"Challenger" model record safe is one of the well designed models on market. Picture courtesy of Protectall Safes Div. of the Mosler Safe Corp.

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Here are motorized files your operator controls — not files that control your operator! In split seconds, WRIGHT ROTARY FILES bring *ANY* record to a worker's hands.

Sleek, modern units that solve all kinds of filing, finding and posting problems, increasing efficiency and production. These units file punched cards horizontally or vertically and all other size cards. Other features include direct forward and reverse controls; electronic safety beam operation.

A selection to fit your needs can be made from 30 different models — all covered with durable, vinyl coated steel that's smart looking and easy to maintain.

Full information about these streamlined additions to the famous Wright Line of Data Processing Accessory Equipment is available. Send now for catalog or call your local Wright Line Branch Office.

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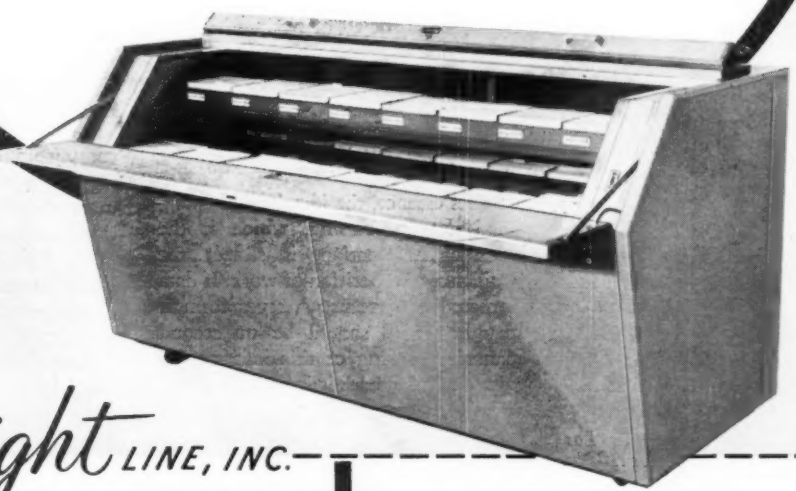

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Company_____

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FCC—Insulated filing cabinets with Class C labels.

FCD—Insulated filing cabinets with Class D labels.

MI—Miscellaneous.

NI—No information available at press time on current products.

PU—"Point of use" record protection equipment, including ledger safes, insulated posting desks, and similar equipment, usually carrying either a Class C or D label.

S—Safes-information on labels not available at press time.

SA—Safes with Class A labels.

SB—Safes with Class B labels.

SC—Safes with Class C labels.

SD—Safes with Class D labels.

Acme Visible Records, Inc., Crozet Va. (FCC)

Acorn Products Co., 4605 W. 21 St., Chicago 50. (MI-Insulated letter files-NI)

R. C. Allen Business Machines, Inc., 678 Front Ave., N.W., Grand Rapids 4, Mich. (FCC; FCD; SA; SB; SC)

Art Steel Co., Inc., 170 W. 233 St., New York 63. (SC-NI)

John D. Brush & Co., 545 West Ave., Rochester 11, N. Y. (SC; SD)

Bentson Mfg. Co., Aurora, Ill. (MI-Safe-desks and telephone cabinet-safes with Class C labels)

Cole Steel Equipment Co., Inc., 415 Madison Ave., New York 17. (S)

Diebold, Inc., 2011 Mulberry Rd., Canton 2, Ohio. (FCC; FCD; PU; SA; SB; SC)

Dolin Metal Products, Inc., 315 Lexington Ave., Brooklyn 16, N. Y. (PU)

Gary Safe Co., 1020 Crocker St., Los Angeles 21. (S-NI)

The General Fireproofing Co., 413 Dennick Ave., Youngstown 1, Ohio. (FCC; FCD)

The Globe-Wernicke Co., Norwood, Cincinnati 12. (FCC; FCD; PU)

Herring-Hall-Marvin Safe Co., 1550 Grand Blvd., Hamilton, Ohio. (FCC-NI; FCD-NI; PU-NI; SA-NI; SB-NI; SC-NI)

In-A-Floor Safe Co., 1416 S. Los Angeles St., Los Angeles 15. (S)

Invincible Metal Furniture Co., Manitowoc, Wis. (MI-Concealed safe unit placed in cabinets)

Kwikset Sales & Service Co., Anaheim, Calif. (S-NI)

LeFebure Corp., 716 Oakland Rd., N.E., Cedar Rapids, Iowa. (PU)

Meilink Steel Safe Co., 1672 Oakwood Ave., Toledo 6, Ohio. (FCC; FCD; PU; SA; SB; SC)

Tools of the Office

Midwestern Mfg. Corp., 419-20 Lemcke Bldg., Indianapolis 4, Ind. (FCC; FCD; PU; SA; SB; SC)

Migh-T-Safe Mfg. Co., 5829 W. Adams Blvd., Culver City, Calif. (S-NI)

The Mosler Safe Co., 320 Fifth Ave., New York 1. (FC; SA; SB; SC)

Protectall Safe Corp., Hamilton, Ohio. (SC)

Remington Rand, Div. of Sperry Rand Corp., 315 Fourth Ave., New York 10. (FCC; FCD; PU; SA; SB; SC)

The Schwab Safe Co., Lafayette, Ind. (PU; SA; SB; SC)

The Shaw-Walker Co., Muskegon, Mich. (FCC; FCD; PU; SC)

The Victor Safe & Equipment Co., Inc., 315 Fourth Ave., New York 10. (FCC; FCD; PU; SA; SB; SC)

Vue-Fax Corp., 655 Main St., Westbury, N. Y. (MI-Insulated vertical-visible equipment-NI)

Visirecord, Inc., Copiague, L. I., N. Y. (FCC-NI; PU-NI)

Watson Mfg. Co., Inc., 63 Taylor St., Jamestown, N. Y. (PU)

York Safe & Lock, Canton 2, Ohio. (FCC; FCD; SA; SB; SC)

Integrated Data Processing Equipment

IN THE past ten years, an old concept has brought about not only great flurries of excitement, but also great concern, great expenditure, great efforts of study and writing, and great misunderstanding. "Automation" is not a new idea, but the development of highly automated machines has caused stirrings in business circles almost as great as those caused by the Industrial Revolution towards the close of the eighteenth century.

Much of this excitement and concern comes about because so little is known about the subject. To some, automation is a panacea for all of business' ills, to others, it is simply a series of machines which react at lightning speed to instructions; to others, it implies a replacement of all workers.

Basis of IDP is simple idea

In its essence, the idea behind integrated data processing, which is the basis of automation, is simply the avoidance of repetition of work. If data is recorded once, in whatever form it may be, there should be no second manual recording of this information regardless of where it is used. Another way to phrase this may be "Never repeat."

This idea of course is not new. It is in use today as it has been in offices for many years, even in those not equipped with high-speed electronic computers. The typist using a carbon paper to make a second copy of the letter she is typing is making use of this principle. "One-writing" payroll systems in which forms are aligned in such a way that repetitive information is written just once, although it appears on several sheets, is another example. An essential part of one-writing systems is of course the design of such forms, and even in the more complex automated systems —those involving electronic computers —the design of forms still plays a very important role in the functioning of an integrated data processing system.

Another illustration of the "Don't repeat" principle is the duplicating machine, especially duplicating equipment of the "systems" type in which certain sections of the material can be selected to suit the forms being used.

The above illustrations show one obvious means of avoiding repetition by recording the original data in all the places it is required at the time of its first recording. This simple idea is also the basis of the second means of accomplishing the avoidance of manual repetition of material—the development of a system in which the information will automatically repeat itself.

The idea of a machine or system of machines which automatically transfers data repeatedly is of course newer than the simple work-saving principles described above, but while the machinery involved, of course, is a thousand times more complex than carbon paper or sets of carbon-interweaved forms, the principle is equally simple.

A thing which is new, especially one which is accompanied by multi-syllable words, is very often surrounded by an air of great mystery which,

For a quick index to the "Tools of the Office" section see page 72

in turn, creates misunderstanding. The hardware of integrated data processing systems is not composed of simple machines. But without taking away from the great technological and scientific advances represented by punched card and punched tape units, computers and other such integrated data processing equipment, the fact remains that the idea of automation is basically a simple one, so simple that it often gives rise mistakenly to the idea that it will be a cure-all for all business problems as well as changing completely the office as we know it today.

Revision of thinking necessary

The successful use of integrated data processing equipment necessitates a revision of thinking and office workflow systems based on the principles of IDP, rather than on the use of the hardware. It is the system which is the most important thing, not the machines, so that it is possible for a very small office to be as fully "automated," in terms of its needs, as a large one using an electronic computer if its work system is based on the same idea of capturing information at the source in some form that will allow that information to flow through the office without ever being manually recopied.

When the method of avoiding repetition involves use of a machine that will allow information to automatically repeat itself, it is necessary that the machine "read" instructions, and on a large scale, necessary that there be some means of having machines transmit the information to other machines. A "machine language" is the answer to this problem.

The first integrated data processing equipment made use of a machine language already in existence, the punched paper tape. These tapes have codes which correspond to letters and numerals and these had already successfully been used with wire transmission equipment such as teletypewriters.

A typist working with a punched tape system types the material in the conventional manner, but as she does so, the machine she is using produces a punched tape as a by-product of her work. From this point on the tape is fed into various machines which "read" it and translate it into electrical impulses. Depending on the complexity or nature of the system, the path of the signals may produce other tapes which may eventually be translated back again into their original form of letters and numbers.

It is necessary in a punched paper tape system to introduce instructions as to what part of the data on the tape should be reproduced and what part should be skipped. It is also necessary to have some form of control over the machines so that they may be stopped for additional information to be inserted at the proper time in the work program. An automatic typewriter is very similar to a tape-controlled machine in this respect.

In a theoretically completely integrated system, human activity would only be necessary to enter new data and start the operation of the work cycle. Each machine would be provided with instructions to proceed automatically as long as it is repeating or acting on previously inserted data. It would stop for changes or insertions and again, in a theoretical situation, this insertion would be a manual one only if it were new to the system. Otherwise, the additional material could be transferred by another machine through a machine language medium. The output of one machine would be fed directly to the next machine in the cycle without human intervention. All machines would be set up to complete all the work in a unified system.

The cost and limitations of the machines themselves make this theoretical fully integrated data processing system remain, for the most part, theoretical at the present time.

Design of system most important

The most important factor in setting up an integrated data processing system is the design of the system. Before the installation of any IDP equipment, planning of the highest order must be done. The time needed for such planning and systems design may seem excessive but if the time expended results in the creation of a system which makes the greatest use of the potentialities of the equipment and comes closest to realizing the theoretical situation, then it is the cheapest part of the entire effort.

In the initial installations of IDP systems, firms had no important experience on which to rely and many costly mistakes were made. There is still no fool-proof method for successful planning and installation of an integrated data processing system, but the one thing which has become clear as a result of these earlier efforts is that without proper planning there can be no substantial advantages gained from such a system.

A large part of the disappointment of the integrated data processing systems which involved computers was caused by the fact that they did not accrue the substantial conventional office work savings that were expected. Increased use of IDP systems makes it clearer just what these machines can and cannot do, and just where their value to a firm lies. Some experts feel that the biggest benefits from an automated system will not come from labor-savings but from the system's ability to provide better, more accurate and more timely information about the operation of a business.

Newness of field creates problems

Another factor to be realized is that the newness of the field itself creates certain problems aside from the lack of a great backlog of experience. Different models are constantly appearing on the market and the field is so relatively young that the exact direction in which it is heading, the machines which may eventually emerge in two years, or ten years, cannot now be clearly envisioned.

Punched tape is just one of the common language media interconnecting office machines. Punched card systems are another method of integrated data processing and other media have been developed or are in the process of being developed. Magnetic tape is one which has been used extensively because of its enormous operating speed, great compactness and unlimited capacity for re-use. Because of its cost and difficulties in handling it in some respects, it is used mainly

Completely transistorized electronic computing machine is built into standard office desk. Courtesy of the Clary Corp.

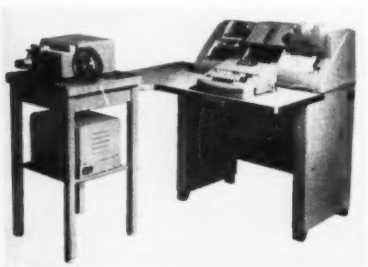
as an internal language within electronic computer systems. The magnetic principle, however, can be used in other physical forms, and the field of banking is particularly interested in magnetic media for its data processing activities. It is reasonable to expect that in the very near future, documents, which are printed with magnetic ink and which are run through machines which can scan the printed figures photoelectrically and then transmit this data onto punched cards or tape for further processing, will become fairly common. One of the biggest problems at the moment is the necessity of developing a typeface or font which will enable the machine to distinguish easily between different letters and numbers which are similar in appearance—eight and three, for instance.

Machines read perforated numerals

Another new idea is the use of a machine to read perforated numerals of the kind that may be punched into a document by a conventional perforating machine. This method is promising because the perforating equipment is a standard item and the marks it makes may be read either by eye or by a sensing machine that is also relatively simple in design.

Another outstanding refinement of operation is the development of "pseudo codes" for computers, written in simple English words, which the computer itself then translates into a whole routine of instructions. This not only vastly simplifies the programming operations of the computer, but also will help relieve the problems caused by a shortage of personnel qualified to translate the flow chart (the descriptive diagram of the steps to be followed by the computer) into the language of the machine.

As was stated before, the whole field of integrated data processing equipment is in a state of flux. And almost every week brings more fresh news of developments in machines geared to automation. A number of small, relatively inexpensive, electronic systems have appeared which make possible the use of high-speed processing in firms which found the larger pieces of equipment too costly.



A removable plugboard for programming and control is a feature of tape-to-card converter developed by Systematics, Inc.

Other developments have come about in auxiliary input and output machines designed to keep up with the speed of the electronic computer in capturing the output data. High-speed printers have been developed, one of which makes use of the xerographic process and prints nearly 5,000 lines a minute. It is thought, however, that possible limitations resulting from incredible speeds will force discovery of other high-speed output methods.

Another developing phase is that of building IDP systems on a unit basis in which the components may be assembled as needed and may be installed remotely from the central data processing unit. Such an arrangement, of course, provides greater flexibility and increases the amount of integration possible with one installation.

Progress made with experience

In another sense, aside from the technical accomplishments being made in the field, significant progress is being seen in the knowledge and experience being gathered from the everyday use of the machines themselves. The more we learn about the machines, their capabilities and their uses, the greater their importance and impact on the business world. This accumulation of greater practical experience will lead, as it is now doing, to the wider use of integrated data processing systems.

The work load of the office is constantly increasing and although IDP systems, when used with an electronic computer, have immense potential for research and solution of management's problems, at the present time the main concern and application is in keeping up with the volume of paperwork that exists now in offices.

In the following pages there has been an attempt to list manufacturers of equipment which reads, processes, transmits, or otherwise handles data in some machine language form. It includes equipment which simply enters data into a common language, equipment used to convert data from one language into another, processing equipment, transmitting equipment and equipment used to "read out" the results into a legible form. In addition, there is also a list of some accessory equipment which is important as it helps facilitate the actual operation of an integrated data processing system.

The Manufacturers

Because of its great diversity, IDP equipment cannot be satisfactorily categorized in the manner used in manufacturers' lists elsewhere in this department. An attempt is made below to describe briefly the general types of products offered by various companies. It should give the reader a reasonably good idea of the types of equipment now available for IDP.

Addressograph-Multigraph Corp., 1200 Babbitt Rd., Cleveland 17. Company has manufactured Graphotypes operated by punched paper tape. Certain of the company's addressing equipment have features such as punches which ally it to punched card operations. Also, the Multilith line of offset duplication equipment uses offset masters which can reproduce themselves and which can be prepared by automatic inputs.

Airborne Instruments Laboratory, Inc., Modac Div., 160 Old Country Rd., Mineola, N. Y. Firm has produced line of Modac custom-built electronic data processing systems in the $100,000 price range, including computers and card-to-tape converters.

Alwac Corp., 13040 S. Cerise Ave., Hawthorne, Calif. Company was previously known as Logistics Research, Inc., and offers two general purpose digital computers, the Alwac IIIE in $100,000 price range and the Alwac 800, a large-scale system, with magnetic core storage and modular construction, using up to 50 magnetic drums through one buffer, with up to 10 buffers and up to 10 magnetic tape transports per buffer.

American Telephone & Telegraph Co., 32 Avenue of the Americas, New York. Company has made extensive line of communications facilities, based mainly on use of 5-channel punched tape, including Number 19 automatic sending and receiving typewriters;

Number 14 transmitter distributors; Number 14 sending and receiving typing reperforators; as well as teletypewriters, and a line of switching systems and selector devices. The firm does research and development work on equipment for high-speed data transmission.

Ampex Corp., 934 Charter St., Redwood City, Calif. Company manufactures magnetic tape transport equipment, such as is being used for input and output in a number of electronic computers and specialized systems, including mail addressing systems, digital magnetic tape handlers, digital magnetic heads for "read" and "write," read-and-write amplifiers for putting digital signal data on the off tape, and specially-formulated magnetic tape. Equipment is rented or leased.

Anelex Corp., 150 Causeway St., Boston 14. Company has produced high-speed Synchroprinters for high-speed printing, with inputs from punched tape, punched cards, magnetic tape, or magnetic drums. The firm has also had magnetic tape transport equipment, including Micro-Tape Steppers.

Bell Telephone Laboratories, 463 West St., New York 14. Research and development work for American Telephone & Telegraph Co.

Bendix Computer Div., Bendix Aviation Corp., 5630 Arbor Vitae St., Los Angeles 45. Firm manufactures G-15 general purpose digital computer in the $50,000 class designed for engineering and scientific work, which also has business applications using punched card and/or punched tape input. Special feature allows computation while input/or output operations are in process. Alpha-numeric paper tape converter may be used for integration with systems using 5-, 6-, 7- and 8-level codes. Firm also has CA-2 punched card and tabulator coupler to be used with G-15 computer.

Burroughs Corp., 6071 Second Ave., Detroit 32. Burroughs Sensimatic-to Tape and Sensimatic-to-Card equipment provides punched tape or tab cards as a by-product to posting primary records.

Burroughs Corp., ElectroData Div., 460 Sierra Madre Villa, Pasadena, Calif. Data originating equipment consists of Photoreaders for both the Burroughs 205 and 220 computers. The 205 photoreader accepts 6-level, binary-coded-decimal information for input to the

office management

leads the field with its news and analysis of

AUTOMATION IN THE OFFICE

As far back as August 1952 when Automation was a word heard only in closed conferences, OFFICE MANAGEMENT released what is believed to be the first significant discussion of Automation in the office field, "Electronics in the Office", featuring the opinions of David Sarnoff, Chairman of the Board at RCA., and John S. Coleman, President, Burroughs Adding Machine Company.

Since the appearance of this article in the August issue of 1952, OFFICE MANAGEMENT has published articles on Automation on a regular basis to keep the office field abreast of everything new on this modern technique. Here are some typical ones:

JANUARY, 1958
How to prepare an office for a computer installation

FEBRUARY, 1958
Basic steps in programming a computer for a single operation
by Ben Conway

YEARBOOK ISSUE, MARCH 15, 1958
Spread of office automation slowed by cautious business mood in 1957
by Robert M. Smith

JUNE, 1958
Why small companies may need automation even more than larger concerns
by Robert M. Smith

JULY 1958
Why small companies need automation even more than larger concerns
Part 2 Equipment for "Automation in the Office"

AUGUST 1958
Why small companies need automation even more than larger concerns. (Conclusion)

SEPTEMBER 1958
The role of automation in freeing managers for more creative work.

OCTOBER 1958
Why new computer coding techniques may accelerate pace of office automation — by Robert M. Smith

WHAT IS AUTOMATION IN THE OFFICE?

Automation in the office is the use of the rapidly multiplying new systems developments and facilities of electronics to synchronize the functions of separate units of equipment into an overall operation. Importantly, while it can and does employ the latest in electronic computers and other new devices, it does not necessarily call for costly or experimental type of machines and equipment. Equipment presently in use in every modern office in America can be geared in one way or another to Automation.

As new progress is achieved and case histories are reported, OFFICE MANAGEMENT will carry the great story forward.

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computer and the 200 photoreader transmits binary-coded decimal information. Conversion equipment in the line consists of the punched card converter which translates and transmits to the Burroughs 205 computer information recorded on standard 80-column punched cards. Data processing equipment of the Burroughs line consists of two general-purpose electronic digital computer systems, the 205 and the 220, and the desk-size E101 computer. The 205 is a medium-scale system incorporating the full range of input-output media—perforated paper tape, punched-card, magnetic tape, keyboard, typewriters and printers. The Cardatron electronic input-output system links the 205 to as many as seven punched-card readers, punches or line printers in any combination. The 220 is an intermediate-priced system with operating speeds up to 10 times those of medium-scale computers. As with the 205, translation between the binary-coded-decimal language of the computer and the codes of the full range of input-output devices is automatic as well as a Cardatron subsystem. The E101 is a desk-size electronic digital computer which is externally programmed through simple program pinboards. Input is through keyboard, perforated paper tape or punched cards. The firm's output equipment consists of a high-speed paper tape punch for use with both the 205 and 220 computers and other output devices marketed by the ElectroData Div. but manufactured by other companies. All equipment may be bought or rented.

Clary Corp., 408 Juniper St., San Gabriel, Calif. New Electronic Computing Machine (ECM), completely transistorized unit is built into standard office desks. Computations are performed by an electronic unit in the drawer section of desk with the results printed automatically on adding machine-type print unit mounted flush with desk top. ECM consists of four desk-mounted units connected by cable, with operations performed by the computation unit either under manual or program panel control. Present models provide for 30 program stops. Certain of the company's standard adding machines and cash registers can be equipped to punch paper tape as a by-product of normal functioning. Clary also offers a variety of machines designed to read codes for automatic input to electronic as well as data printers, printing timers, and electric input keyboards.

Photoelectric tape reader, manufactured by Ferranti Electric, Inc., reads up to 220 characters per second.

Comptometer Corp., 1735 N. *Paulina St., Chicago 22.* Comptotape equipment consists of a modified Comptometer Calculator and a programmed punching unit for punching results of calculation into paper tape for further processing. Codes of from 5 to 8 channels may be used.

Copy-Craft, Inc., 105 Chambers St., New York 7. The Ormig Selective Data Printer produces from a given master all information on that master or selected data condensed on single item tickets.

Cummins-Chicago Corp., 4740 N. Ravenswood Ave., Chicago 40. The Perf-O-Data equipment encodes documents by perforation. The Perf-O-Reader is a character-scanning unit which scans the perforated characters by means of a photoelectric reading device. Other equipment includes an auxiliary keyboard which provides for manual entry of variable information or corrections.

Dage Television Div., Thompson Products, Inc., W. Tenth St., Michigan City, Ind. Firm has made line of closed circuit television equipment, which is used in some automatic systems to speed exchange of visual information, as in verifying signatures on documents.

Dashew Business Machines, Inc., 5996 Smiley Drive, Culver City, Calif. The firm has manufactured equipment for embossing metal plates automatically from punched tape, punched cards, magnetic tape and automatic tag embossers. Plates can be used to print data on records.

Datamatic Corp., 151 Needham St., Newton Highlands 51, Mass. This company makes the general-purpose high-speed data processing system, Datamatic 1000, which consists of integrated electronic units designed to sort, merge, maintain large files on tape, and perform related business processing operations. Input data may be read from punched cards or punched paper tape onto magnetic tape. Unit has output conversion system where data may be selectively extracted, edited and printed out in a wide variety of formats on a 900-line-a-minute printer.

Dennison Mfg. Co., 300 Howard St., Framingham, Mass. Dennison Print-Punch Marking Machines produce punched tags which become basic originating media for data-processing. Applications are not only in retail stores for merchandise control but for inventory control, piece rate payroll, etc. Capacity of coded information is 31 columns, plus an additional 28 columns of variable characters printed only. The 5-channel code may be converted to standard punched cards or punched paper tape.

Ditto, Inc., 6800 McCormick Rd., Chicago 45. The firm has manufactured systems-type spirit duplicators for data selection and repetition in integrated systems.

Allen B. DuMont Laboratories, Inc., 750 Bloomfield Ave., Clifton, N. J. The firm has made closed circuit television equipment usable in data handling systems.

Eastman Kodak Co., 343 State St., Rochester 4, N. Y. The company has made, in collaboration with Addressograph-Multigraph, special-purpose electronic data processing systems for mailing operations. The firm's Verifax Copier may be used in a supporting capacity with data processing equipment.

Electronic Associates, Inc., Long Branch, N. J. The firm makes analog computers, designed primarily for scientific and engineering work. The Data-plotter takes data from punched cards or punched paper tapes and plots this information in continuous-line graphs. In this way, data from electronic computers are put into graphic from.

Electronic Corp. of America, 10 Potter St., Cambridge 42, Mass. This com-

pany has produced a series of Magnefiles, electronic units, desk-size, for maintaining perpetual inventory information, with various inputs. Computation facilities are also offered.

Farrington Mfg. Co., Industrial Center, Needham Heights 94, Mass. The firm makes special-purpose systems, including Charge-Plate credit identification systems and Scandex, used in punching cards from inputs of printed numbers scanned photo-electrically.

Ferranti Electric Inc., Electronics Div., 95 Madison Ave., Hempstead, N. Y. The firm manufactures the Pegasus, Mercury and Perseus digital computers; photoelectric paper tape reading and spooling equipment; the Business Transactor which reads pencil marks on cards and is available in various configurations with various punching or printing facilities as required; and the Buffer Storage Unit which is inter-connecting equipment for rate changing.

Fisher & Porter Co., Hatboro, Pa. Firm makes automation equipment for industrial applications; a line of data reduction equipment used for readout from manufacturing processes.

Wm. A. Force & Co., Inc., 220 Nichols Ave., Brooklyn 8, N. Y. Firm has numbering machine for electronic data processing which prints dots, dashes or specially shaped figures instead of conventional numerals for use as input data.

Friden, Inc., 2350 Washington Ave., San Leandro, Calif. Company manufactures Selectadata, punched tape apparatus for integrated data processing systems. Teledata is a tape transmitter-receiver for 5-, 6-, 7- and 8-channel tape transmissions. Friden also makes the Flexowriter, Solenoid Input Adding Machine, Solenoid Input Printer Adding Machine with Electrical Output, Adding Machine with Electrical Output and Solenoid Input, and the Solenoid Input Add-Punch. The Computypers are automatic billing machines.

General Electric Co., 1103 No. Central Ave., Phoenix, Ariz. Firm has been developing specialized data processing equipment, some to handle bank bookkeeping, and components for National Cash Register 304 computer.

Haloid Xerox, Inc., 2-20 Haloid St., Rochester 3, N. Y. Company makes "print-out" systems including the SC-5000 which uses the xerographic process which can print at rate of 10,000 characters per second. Firm also makes Xerox Copyflo Continuous Printers which print from original documents or microfilm at rate of 20 ft. per minute.

Intelligent Machines Research Corp., 7019 Edsall Rd., Alexandria, Va. The IMR Character Sensing Eye uses optical scanning and digital logic to recognize typed and machine printed characters from business documents. The recognized characters are then punched in tabulating cards, perforated in paper tape or recorded on magnetic tape. Character reading rates are usually from 200 to 400 per second. IMR Selfchek Type uses a common language for both human beings and machines.

International Business Machines Corp., 590 Madison Ave., New York 22. The IBM line of data processing equipment is very extensive. Data originating equipment includes the IBM 824 and 826 typewriter card punches and the IBM 884 typewriter tape punch, plus other equipment used to create and verify IBM punched card accounting documents for subsequent machine accounting and data processing operations. The firm's conversion equipment includes the IBM 46 Tape to Punch machine, the IBM 47 Tape to Card Printing Punch, the IBM 63 Card-Controlled Tape Punch, the IBM Data Transceiver and the IBM Printing Data Transceiver. Data Processing equipment includes the IBM 604 Electronic Calculating Punch, the IBM Electronic Calculator, the IBM 650 medium-sized data processing system, the IBM 305 Ramac medium-sized data processing system for the "in-line" processing of general accounting data, the IBM 704 large-scale data processing system designed primarily for scientific computation, the IBM 705 large-scale data processing system designed primarily for business calculations as is the later 705-III data processing system, the IBM 709 large-scale data processing system for both scientific and business computation, the IBM 7070 data processing system which has complete transistorization and modular construction, IBM accounting machines, the IBM Series 50 line of punched card accounting machines designed specifically for the smaller business and the IBM 858 Cardatype Accounting machine.

Output equipment consists of card punches, magnetic tape units, printers and/or electric typewriters as well as the 40 Cathode Ray Tube Recorder which can be used with the IBM 704 and 709 systems to provide visual output on a pair of television-like tubes.

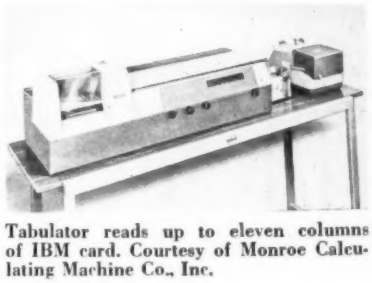
International Standard Trading Corp., 22 Thames St., New York. Firm has made communications equipment in a wide range and is an affiliate of International Telephone & Telegraph Corp. Included are a variety of typewriter models and related equipment, for many IDP functions.

International Telephone & Telegraph Corp., 67 Broad St., New York. Communications facilities. See listing above for International Standard Trading Corp.

A. Kimball Co., 8 Rewe St., Brooklyn 11, N. Y. Company manufactures the "75" Punch Print Machine and the Portable Tag Reader for merchandise tags.

Kleinschmidt Laboratories, Div. of Smith-Corona Marchant Inc., Lake-cook Rd., Deerfield, Ill. Company's equipment includes page printers to transmit and receive, or receive only, message or data information over standard transmission media, typing reperforators for sending and receiving, or receiving only, message or data information using perforated and interpreted tapes or for preparing perforated tapes, tape transmitters to transmit message or data from perforated tape and tape relay equipment and components for fully automatic teleprinter switching facilities.

Laboratory for Electronics, Inc., 75 Pitts St., Boston 14. Firm has made large-scale general-purpose electronic data processing system for both in-line and off-line data processing applications.



Tabulator reads up to eleven columns of IBM card. Courtesy of Monroe Calculating Machine Co., Inc.

Litton Industries, 336 N. Foothill Rd., Beverly Hills, Calif. This company has made small electronic calculators and other equipment.

Monroe Calculating Machine Co., Inc., Box 540, Orange N. J. Firm manufactures the Synchro-Monroe President punching tape which consists of three units: an accounting machine wired for punching, the Control Chassis and the Unitized punched tape. The Synchor-Monroe Card Punch Verifier consists of a solenoid operated 10-key adding machine and a control chassis cable connected to a card punch machine. The Synchro-Monroe Tabulator reads up to 11 columns of a punched card, lists figures on adding machine and totals automatically at completion of cards stacked. The Synchro-Monroe Adding Machine is a full keyboard adding and listing device which includes a tape punch developed by Monroe.

The National Cash Register Co., Main & K Sts., Dayton 9, Ohio. The company manufactures various types of IDP equipment. IDP input equipment includes cash registers, accounting machines, bookkeeping machines and adding machines which can be linked to paper tape recorders or coupled to card punches. The NCR 304 electronic data-processing system is designed for commercial applications and accepts both punched tape and punched cards from NCR recording equipment. NCR also has a complete system for the automation of checking-account bookkeeping in banks, that can also be used for other applications.

Philco Corp., Tioga & C Sts., Philadelphia 34. Large electronic computer systems.

Potter Instrument Co., Inc., Sunnyside Blvd., Plainview, N. Y. Firm has manufactured components for IDP systems including Magnityper high-speed printers, magnetic tape handlers, punched tape readers, random access memory units, etc.

Accounting machine equipped with paper tape recorder is made by the National Cash Register Co.

Radio Corp. of American, Front & Cooper St., Camden, N. J. Firm has manufactured large-scale electronic computers of the Bizmac line. Inputs include punched cards, punched tape, keyboards, etc. A variety of outputs is available.

J. B. Rea Co., Inc., 1723 Cloverfield Blvd., Santa Monica, Calif. Firm has manufactured Readix general-purpose electronic computers in the small-to-medium price range together with accessory equipment.

Remington Rand, Div. of Sperry Rand Corp., 315 Fourth Ave., New York 10. This company has introduced an electronic punched tape typewriter, a development of the common language concept which automatically creates and reads paper tape that activates other equipment and wire communications systems. The firm also has a wide line of electronic computers and punched card equipment, including the Univac II and the smaller Univac 120 and Univac 60. Other equipment includes paper-tape punching typewriter, punched-card-to-punched-tape and punched-tape-to-punched-card converters, high-speed printers, Point O'-Sale Recorders for reading pre-punched merchandise tag and converting data into punched tape, magnetic tape storage facilities in mobile trucks, and an extensive line of punched card equipment including punches, reproducers, calculating punches, sorters, tabulators and so on.

Royal McBee Corp., Westchester Ave., Port Chester, N. Y. Keysort Tabulating punch is complete punched card processing unit which automatically code-punches original records, reads coded values, tabulates, duplicates coding into blank cards and punches net accumulations into blank cards. The IGP-30 Electronic Computer is a small, desk-sized, low-cost general-purpose electronic digital computer having punched paper tape to direct typewriters as input and output devices.

Scriptomatic, Inc., 300-16 N. 11th St., Philadelphia 7. The firm produces the 101-S addressing machine which can read punched card fields and a line of data writing and addressing equipment which prints from punched cards, ledger cards and many other types of card medium.

Shepard Laboratories, Inc., Broad St. at Park Ave., Summit, N. J. Firm makes high-speed input-output accessories for electronic computers and electronic data processing systems including the High Speed Electronic Typer which prints from 600-900 lines per minute, the Servo Transport Digital Tape Reader, the Electronic Decoder, and Electronic Converter.

Soroban Engineering, Inc., Box 1717, Melbourne, Fla. Company makes line of IDP components including paper tape reader, paper tape perforator, verifying punch, paper tape comparator, "Computeriters" (automatic tabulators) and coding keyboards.

The Standard Register Co., Campbell & Albany Sts., Dayton 1, Ohio. Stanomatic electronic code senser "translates" common language information into other machine languages. Those can be translated by Stanomatic for such equipment as card punches, tape recorders, tape-reading typewriters, computers, high-speed printers, etc.

Stanford Research Institute, Menlo Park, Calif. Research and development work such as the ERMA, a bank bookkeeping system using magnetic codes on paper documents.

Stewart-Warner Electronics, 1300 N. Kostner Ave., Chicago 51. Firm has produced the S-W Electronic Data Processing Unit, a small digital computer, and Datafax facsimile equipment used for transmission of data over telephone circuits.

Stromberg-Carlson Co., San Diego, 1895 Hancock, San Diego, Calif. Firm produces readout and display equipment which translates symbolic information such as pulses and voltage levels into a form comprehensible by human beings.

Stromberg Time Corp., Thomaston, Conn. Firm makes the Transacter which can accept data from widely scattered sources, and transmit them to data processing center where the information is automatically converted into machinable paper tape.

Donald MacGregor, Vice President—Production, Zenith Radio Corporation

"Moore forms help us keep inventories at healthy levels"

CONTROL REGULATES ZENITH'S PRODUCTION OF FINISHED TV SETS TO THE MARKET DEMAND

A new system keeps Zenith Radio Corporation from 'running in the dark' when scheduling production. A daily report gives management complete production information at the opening of business each day. This allows faster changes in scheduling, purchasing, and production. Deliveries to distributors go out on time. Capital isn't frozen in large inventories.

On the operating side, data from the production lines and the warehouse are 'captured' in punched cards and fed into an electric accounting machine. The machine prints, on a 6-part Moore continuous form, actual factory performance and scheduled production for comparison. This is Zenith's control in print.

The new Zenith system has brought many operating benefits. With only one copying step, errors are cut to a minimum. Preparation time has been chopped from as much as 10 hours to 2½ hours. Savings in clerical time—5600 hours a year.

The Moore man advised on form design for this Automated Data Processing (ADP) system. For more information and other examples of Moore-planned systems, and the forms tailored to them, write to the nearest Moore office.

MOORE BUSINESS FORMS, INC., Niagara Falls, N. Y., Denton, Texas; Emeryville, Calif. *Over 300 offices and factories throughout U.S., Canada, Mexico, Caribbean and Central America.*

Build control with

MOORE BUSINESS FORMS

Systematics, Inc., 60 E. 42 St., New York 7. The firm produces intercoupling equipment to connect various types of accounting machines, adding machines, and billing machines to key punches and punched tape equipment for automatic production of common language records. The firm also makes tape-to-card, tape-to-tape and card-to-tape conversion equipment.

Taller & Cooper, Inc., 75 Front St., Brooklyn 1, N. Y. Firm makes Peripheral Data Processing equipment which has to do with the production, accumulation and conversion of data at its point of origin.

Technitrol Engineering Co., 1952 E. Allegheny Ave., Philadelphia 34. Firm makes components for assembly on a "modular" basis to make large-scale electronic computer systems.

TelAutograph Corp., 8700 Bellanca Ave., Los Angeles 45. Firm makes closed circuit TV for data transmission and, with Olivetti, teletypewriter equipment which prepares perforated tapes at same time and the TsTA automatic tape transmitter.

Telecomputing Corp., 12838 Saticoy St., North Hollywood, Calif. Firm makes Point O'Sale Recorders for reading pre-punched merchandise tags and converting data into punched paper tape and tape-to-card converting equipment.

Teleprinter Corp., 26 Park Place, Paramus, N. J. Firm has made Mite teletypewriter equipment of unusually small size.

The Teleregister Corp., 445 Fairfield Ave., Stamford, Conn. Company has made specialized electronic equipment, including automatic reservations systems for transportation companies, etc.

General-purpose electronic digital computer designed by Royal McBee Corp. for broad applications in data processing.

Tools of the Office

Teletype Corp., 1400 Wrightwood Ave., Chicago 14. Firm has offered extensive line of communications equipment usable for data transmission, including teletypewriters, tape perforators, tape reperforators, tape printers, page printers, message relay equipment, etc.

Typatape, Inc., 60 E. 42 St., New York 17. Firm has offered Typatape Recorders for providing a completely mechanical link by which existing business machines can print common language codes on a paper tape, and Typatape Converters to read the tape and punch cards from them.

Underwood Corp., 1 Park Ave., New York 16. The firm's Data-Flo Systems consist of various combinations of tape-reading, tape-punching typewriters and adding machines. Programming is by means of removable plugboards which can be easily interchanged for different jobs. The Underwood Electronic Business Computer is desk-sized with maximum equipment capacity of two output printers, two tape punches, and two tape readers.

Victor Adding Machine Co., 3900 N. Rockwell St., Chicago 18. Firm's electric adding and multiplying (Digit-Matic) machines can read uncoded decimals or, through "translators," can be actuated by common language inputs and used to list, or to list and perform, arithmetical functions. Sales Register and Analysis System uses tape-punching adding machine or cash register to record sales at the point of sale and a centrally located analyzing unit operated by tape.

Western Electric Co., Inc., 195 Broadway, New York 7. This company manufactures equipment for American Telephone & Telegraph Co.

The Western Union Telegraph Co., 60 Hudson St., New York 13. Company has complete wire communications facilities including circuits, available for use in IDP. Equipment includes sending and receiving teleprinters, tape perforators, message relaying, sorting and switching equipment, facsimile equipment, etc.

For a quick index to the "Tools of the Office" section see page 72

IDP Accessories and Services

American Lithofold Corp., 53 W. Jackson Blvd., Chicago 4, Ill. Firm has continuous and unit sets of business forms and Electronic Remitters which are invoice or statement forms which carry their own, built-in, return stamped envelope through all data processing equipment. Flip-Fold continuous forms eliminate need of carbon paper, deleaving and forms bursting.

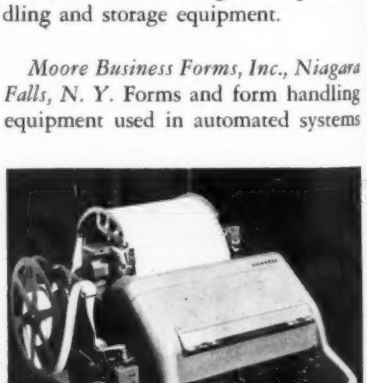
Cycle Equipment Co., 17480 Shelburne Way, Los Gatos, Calif. Tape Minder equipment for handling punched paper tapes.

Diebold, Inc., 2011 Mulberry Rd., Canton 2, Ohio. Firm has made storage equipment for IDP common language media.

Dresser Products, Inc., P.O. Box 2035, Providence 5, R. I. Winding, folding and filing equipment for coded paper tapes, center feed unwinders, buffer boxes, unwind cans, and other data processing accessories.

Monarch Metal Products, Inc., New Windsor, Newburgh, N. Y. Data processing auxiliary equipment includes files, control panel cabinets, trucks, trays, card punch desks, mobile racks, Filaways, storage racks, sorter equipment, tub files and magnetic tape handling and storage equipment.

Moore Business Forms, Inc., Niagara Falls, N. Y. Forms and form handling equipment used in automated systems



Teletypewriter with tape reperforator attachment is a product of the Olivetti Corp. of America and TelAutograph Corp.

together with research facilities for forms development.

Ray Myers Corp., 204 Washington Ave., Endicott, N. Y. Files and handling equipment for punched cards, magnetic tape and other data processing accessories.

Shaw-Walker Co., Muskegon, Mich. Vertical-visible equipment for tapes, edge-punched cards and punched cards.

The Standard Register Co., Campbell & Albany Sts., Dayton 1, Ohio. Facilities for designing and testing IDP forms and systems.

Systems Sales Co., 13 Broad St., Binghamton, N. Y. Storage and sorting equipment for tab cards and electronic computer accessories.

Tab Products Co., 995 Market St., San Francisco 3. The firm's extensive line of data processing auxiliary equipment includes cabinets, racks and trucks, for reels and punched card files, Storaways and other control panel cabinets.

Uarco, Inc., 141 W. Jackson Blvd., Chicago 4. The company designs forms for IDP systems and testing facilities and systems analysis services.

Visirecord, Inc., Copiague, L. I., N. Y. Firm has storage equipment for punched paper tapes and edge-punched code records. Forms available include "vertical-visible" records which may have codes punched into an edge, other records with pockets for storage of tapes, and panels for tape storage.

Wheeldex & Simpla Products, Inc., 40 Bank St., White Plains, N. Y. Firm has equipment for storing punched paper tapes, either alone or in combination with their associated records.

Whiteford Laboratory, 420 Market St., San Francisco 11. Company has Servo-mechanisms for punched paper tape of various widths.

The Wright Line, Inc., 160 Gold Star Blvd., Worcester, Mass. Firm manufactures a complete line of accessory data processing equipment for tape and handling.

Intercommunications Equipment

THROUGHOUT the day in every office a constant exchange of information takes place. Information is the basis for the existence of any office. All work centers about it. Facts must be obtained; they must be worked on; conclusions must be drawn from the data; actions must be taken; and then information on the results of the actions must be distributed. The faster the distribution of information the faster all office operations will proceed.

Intercommunications office necessity

An important part in the distribution and exchange of information in the office is played by intercommunications equipment. "Intercommunications equipment" in this sense means the physical devices which convey the spoken word or written messages almost instantaneously. It includes such devices as sending and receiving stations, telephones, code call paging systems, "electronic longhand," teletypewriting equipment, pneumatic tubes and some kinds of conveyor belt systems.

Because this type of equipment is used primarily for conveying information with great speed, it can be used to meet emergencies at times. More commonly, it serves control functions and is used to maintain the much greater flow of routine paper work.

Almost all intercommunications equipment is electrical in nature. It therefore requires some form of connection by which electrical signals may be sent back and forth between the various stations of the system. As the type of connecting system has a great deal of bearing on the type of work the equipment can handle, the equipment will be classified under the various systems used to transmit different types of communications.

Voice transmission may be carried by "wireless" systems, by direct-wire systems, or systems which make use of a central switchboard.

The wireless system bears this name because it does not require special wiring to connect the units. It makes use of existing electrical circuits such as are used for conventional desk lamps. The individual stations are plugged into the existing connections; the regular wiring carries the voice from one station to another. Generally, this type of equipment is the least expensive.

Wireless equipment flexible

The wireless type of equipment is extremely flexible since a station can be unplugged, moved, and plugged in again wherever it is needed at a new location. The individual units are usually small and light and sometimes they are equipped with handles for easier portability. Obviously, the number of units required in a wireless system is less than would be needed if it were necessary to install fixed units in every location where a man might need one.

Limitations are, of course, to be found in this system. Equipment cannot reach locations not served by the same main power transformer and every station operating on the same frequency can hear all conversations. Privacy may be obtained by having units which provide a choice of frequencies, which may be selected at will.

Special wiring required

The direct-wire type of equipment requires its own wiring installation in which each station is directly wired to all other stations with which contact can be established. This system is intended primarily for small installations because of the complex wiring which would be needed for large systems.

Lokator paging system pages personnel anywhere in building with coded call signals. Courtesy of Edwards Co., Inc.

Direct-wire systems are usually so constructed that other stations in the system are selected at the calling station by a selector button or lever which completes the connection.

A variety of units are found in these installations. They may be telephones, or cabinets mounted in desks or on walls. Some of the cabinet units may be equipped with accompanying loudspeakers or telephone handsets.

Unlike most wireless systems, the direct-wire intercommunications systems offer privacy in most cases, with as many separate conversations possible as there are pairs of stations in the system. Other accessory features in such a system may permit connections with public address systems or mobile radio equipment, "memory" devices permitting a call to a busy station to be placed automatically as soon as the previous call is completed, extension stations for secretaries, dial tones, volume controls, background music when the stations are not used and several others. Some systems permit conference calls among a number of stations.

Many variations possible

Direct-wire systems may be very simple, limited to just two stations, or quite complex so that an executive may have a master station with all of the features a direct-wire system can have, while a less important position may be set up in the same intercommunications network so that it can only receive calls over a loudspeaker.

If a communications system is too large for direct-wire use, a central switchboard is generally used. Each station is connected to the switchboard and connections to other stations in the system or outer-office calls are made at the board. These connections may or may not require a human operator. The use of transistors has made the latest equipment of this type rather compact.

The conventional station used in such systems is of the dial telephone type and stations are usually called by dialing. Some telephones may be designed for desk or wall mounting. Stations may have loudspeaker facilities.

Switchboard offers flexibility

All of the flexibility of features available with direct-wiring systems is, of course, available with the use of larger systems which use central switchboards. Conversations are completely private; conference calls can be arranged; connections can be made with mobile radio equipment and public address systems; adaptations can be made for use with central pool dictating equipment; and other features are also available such as executive right-of-way and "memory" devices which will hold a call, if a line is busy, on a wire until it is clear. Switchboards too can be used as part of a paging system.

Voice and code paging

Paging systems are used for transmitting both the voice and codes whether they be in the form of lights, gongs, chimes or other signals. They may be used for broadcasting individual calls or announcements throughout a building or area. They may announce work or rest periods or call individuals to a telephone. Strategically placed loudspeakers used in conjunction with the human voice or sound devices help comprise the system. Calls are sent out from a central unit. Most paging systems employ connections of the direct wire type. Some, however, use portable wireless units which are plugged into electrical circuits, as are the voice transmitting units of this type of equipment. Employees who move about carry paging units with them which reduces the number of paging units needed.

Radio principles are also used in some paging systems and once again the development of transistors has made possible the construction of receiving units of very small size and weight. Individuals expecting calls may wear receiving units on lapels or carry them in their pockets. A radio paging system usually requires the installation of a loop antenna in the building in which it is to be used.

The almost instantaneous transmission of written messages and objects within a company may take place with other types of equipment.

Belt and tubes speed work flow

Conveyor belt and pneumatic tube systems are two of the means by which objects or documents may be physically transferred. Some of this equipment requires sorting and redirecting of the objects transmitted at central control stations, while other systems have controls for automatic rerouting of the material. Some companies are finding increasing use for these systems in their mailroom and filing operations.

Another method of sending written messages quickly within a company is through the use of "electronic longhand" equipment. Messages are written with an electrified pen whose movements are duplicated at a remote location by another pen which writes a copy of the original message. Direct-wire connections are used and multi-station conference hook-ups are possible. One advantage offered by this system is that it provides written records and can be used for filling in

The "Telescriber" is a message receiving and sending unit developed by the TelAutograph Corp.

The Fonex 15-call set is a direct wire intercom station. Courtesy of Transelectric Mfg. Co.

Continental Mfg., Inc. produces the "Harmony" phono-radio-intercom combination.

Henry F. Zartl, Manager, Teletype Dept., The DoALL Company, Des Plaines, Illinois

DoALL's "Sameday Service" assured by Teletype

Over 100,000 customers have immediate access to the DoALL Company's $2 million dollar centrally located cutting tool and gage inventory.

Here's how it works. If a customer requests an out-of-stock tool at any of DoALL's 37 sales-service stores, an order is dispatched in seconds via a Teletype printer to DoALL's central warehouse.

The request, received in printed form, is processed in a matter of minutes. The order is filled, packaged and shipped—all in an average time of two hours from receipt of request.

For customers—reduced inventory, wider choice. The speed and accuracy of Teletype equipment makes the entire DoALL inventory of 15,000 items immediately available to the customers.

For DoALL—more, profitable business. Offering immediate delivery on hard to find, non-standard cutting tools brought in more business. And DoALL's Teletype equipment reduced paper handling costs so efficiently that low-ticket items became profitable.

More information. If you would like more information about the DoALL story, or the Teletype Model 28 equipment shown here, please write to Teletype Corporation, Dept. 33A, 4100 Fullerton Avenue, Chicago 39, Illinois.

TELETYPE®
CORPORATION
SUBSIDIARY OF *Western Electric Company* INC.

Use Readers' Inquiry Coupon on Page 188

business forms remotely and for transmitting hand-drawn sketches and diagrams.

Facsimile equipment, normally used for long distance transmission, has some internal applications. With this method, almost any type of material of a printed, drawn, typed, written or photographically reproduced nature can be scanned photo-electrically. The impulses generated as a result reproduce the material at a remote location by "burning" a sensitized paper with the electric current. Some models permit the copying of flat material of unlimited length.

Teletypewriting facilities normally used for long distance wire transmission also can be used for internal company communications.

Intercommunication equipment has been of great importance in easing and streamlining procedures in offices regardless of their size. The trend in the development of intercommunications today is to continue and strengthen the role that this type of equipment plays in office procedures.

The Manufacturers

The following list covers the principal manufacturers of intercommunications equipment of various types.

The code symbols in the list are as follows:

C—Conveyor systems.

EH — Systems employing a form of "electronic handwriting."

F—Equipment of the facsimile type.

MI—Miscellaneous.

NI — No information available at press time on current products.

P—Pneumatic tube systems.

PD—Paging equipment of the direct wire type.

PMI — Paging equipment, miscellaneous.

PR—Paging equipment using radio.

PSA — Paging equipment using an automatic switchboard.

PSM — Paging equipment using a monitored switchboard.

PW — Paging equipment of the "wireless" type.

T—Teletypewriter equipment.

VD—Voice equipment of the direct wire type.

VMI—Voice equipment, miscellaneous.

VR—Voice equipment, using radio.

VSA—Voice equipment using an automatic switchboard.

VSM — Voice equipment using a monitored switchboard.

VW—Voice equipment of the "wireless" type.

Action Systems Co., 1 Vanderbilt Ave., New York 17. (PD; VD)

Aircall, Inc., 224 E. 38 St., New York. (PR-NI)

Airmatic Systems Corp. (an associate of International Telephone & Telegraph Corp.), 378 Bergen Blvd., Fairview, N. J. (P-NI)

Allied Radio Corp., 100 N. Western Ave., Chicago 80. (PD; VD)

American Development Electronics Co., 210 Central Ave., Newark 3, N. J. (VD)

American Mica Radio Corp., Manasquan, N. J. (NI)

American Telephone & Telegraph Co., 195 Broadway, New York. (T, VSM)

Auth Electric Co., 34-20 45 St., Long Island City, N. Y. (PD-NI; PR-NI; PSM-NI; VD-NI; VSM-NI)

The Autocall Co., 55 Tucker Ave., Shelby, Ohio. (PD)

Automatic Electric Sales Corp., Northlake, Ill. (VSA; PSA)

Bell Sound Systems, Inc., 555 Marion Rd., Columbus 7, Ohio. (VD-NI)

Bliss Electronic Corp., Box 366, Sussex, N. J. (PSA; VD; VSA)

David Bogen Co., Inc., P. O. Box 500, Paramus, N. J. (PD; PSA; PSM; VD; VW)

Cambridge Co., 2561 N. Clark St., Chicago 14. (PD; VD)

Carter Industries, 70 McLean Ave., Yonkers, N. Y. (MI-Telephone dial lock)

Continental Mfg., Inc., 1612 California St., Omaha, Nebraska. (PD; VD; VMI-Background music)

S. H. Couch Co., Inc., 3 Arlington St., N. Quincy 71, Mass. (PD; PSA; VD; VSA; VSM)

Dictograph Products, Inc., 95-25 149 St., Jamaica 35, N. Y. (PR; VD; VR)

DuKane Corp., 103 N. Eleventh Ave., St. Charles, Ill. (PD; PR; PSA; VD; VR; VSA)

Edwards Co., Inc., 90 Connecticut Ave., Norwalk, Conn. (VD; PD)

Electronic Communications, Inc., Air Associates Div., Teterboro, N. J. (F-NI)

Electro-Vox Intercom Corp., 3 E. 54 St., New York 22. (PD; PSA; VD; VSA)

Executone, Inc., 415 Lexington Ave., New York 17. (PD; MI-Sound systems; VD)

Fanon Electric Co., Inc., 98 Berriman St., Brooklyn 8, N. Y. (PSA; PSM; PW; VSA; VSM; VW)

Federal Telephone & Radio Co., 100 Kingsland Rd., Clifton, N. J. (PR-NI; PSA-NI; VR-NI; VSA-NI)

Feiler Engineering & Mfg. Co., 8026 N. Monticello Ave., Skokie, Ill. (PW; VW)

Friden, Inc., 2350 Washington Ave., San Leandro, Calif. (T-NI)

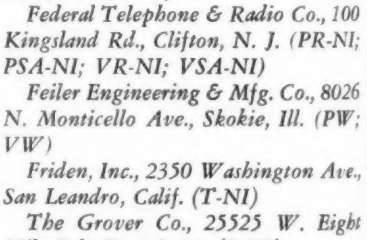
The Grover Co., 25525 W. Eight Mile Rd., Detroit 19. (P-NI)

International Business Machines Corp., 500 Madison Ave., New York 22. (MI-Data transceivers)

Interlex Systems, 22 Thames St., New York 6. (C; P; PR; PW; T; VD; VR; VSA; VW)

Kellogg Switchboard & Supply Co., 6650 Cicero Ave., Chicago 38. (PD; PSA; VD; VSA)

Fanon Electronic Sales Corp. offers a twenty-station telephone switchboard with power supply, busy lamps and buzzer.



The Challenger intercom system consists of both master and remote stations. Courtesy of David Bogen Co.

Kleinschmidt, Inc., County Line Rd., Deerfield, Ill. (T-NI)

L & O Research & Development Corp., 134 N. Wayne Ave., Wayne, Pa. (F-NI)

Lamson Corp., 10 Lamson St., Syracuse 1, N. Y. (C; P)

Line Electric Co., 1407 McCarter Highway, Newark 4, N. J. (PSM-NI)

J. M. Loge, Sound Engineers, 2171 W. Washington Blvd., Los Angeles 18. (PD; VD)

Mohawk Business Machines Corp., 944 Halsey St., Brooklyn 33, N. Y. (MI-Recording unit for transmitting paging calls)

Motorola Communications & Electronics, Inc., 4501 Augusta W. Blvd., Chicago 51. (PR; VR)

North Electric Co., 553 S. Market St., Galion, Ohio. (PD; PSA; VD; VSA; VSM)

Philco Corp., Tioga & C Sts., Philadelphia 34. (PR-NI)

Radio Corp. of America, Commercial Electronic Products, Front & Cooper Sts., Camden 2, N. J. (PD; PSA; VD; VSA)

The Rapids-Standard Co., Inc., Rapistan Bldg., Grand Rapids 2, Mich. (C-NI)

Rauland-Borg Corp., 3515 W. Addison St., Chicago 18. (PD-NI; VD-NI)

Servus-Fone Div., Motiograph, Inc., 4441 W. Lake St., Chicago 24. (PSM-NI; VSM-NI)

Mark Simpson Mfg. Co., Inc., 32-28 49 St., Long Island City 3, N. Y. (PD-NI; PW-NI; VD-NI; VW-NI)

Smith-Corona Inc., 701 E. Washington St., Syracuse 1, N. Y. (T)

Wm. M. Smith Co., 20 Ferguson Ave., Broomall, Pa. (PD; VD)

Stewart-Warner Electronics, 1300 N. Kostner Ave., Chicago 51. (F-NI)

Stromberg Carlson Co., Div. of General Dynamics Corp., Special Products Div., 1400 N. Goodman St., Rochester, N. Y. (PD; PSA; VSA)

Talk-A-Phone Co., 1512 S. Pulaski Rd., Chicago 23. (PD; PW; VD; VR; VW)

TelAutograph Corp., 8700 Bellanca Ave., Los Angeles 45. (EH; MI-Closed circuit TV for data transmission; T)

Telecom, Inc., 1019 Admiral Blvd., Kansas City 6, Mo. (PSA; VSA)

Tele-Norm Corp., 55 W. 42 St., New York 36. (PD; PSA; VD; VSA)

Teleprinter Corp., 26 Park Pl., Paramus, N. J. (T-NI)

The Teleregister Corp., 445 Fairfield Ave., Stamford, Conn. (MI-Special electronic reservations systems-NI)

Tools of the Office

Teletype Corp., 4100 Wrightwood Ave., Chicago 39. (T)

Terry-Phone, Inc., 3805 Paxton St., Harrisburg, Pa. (PD-NI; VD-NI)

Times Facsimile Corp., 540 W. 58 St., New York 19. (F)

Transelectric Mfg. Co., 53 Hopewell Rd., Oxford, Pa. (VD)

Vocaline Co. of America, Inc., 100 Bristol Bldg., Old Saybrook, Conn. (PW; VW)

Webster Electric Co., 1900 Clark St., Racine, Wis. (PD; VD; VW)

The Western Union Telegraph Co., 60 Hudson St., New York 13. (F; T)

The Wheeler Insulated Wire Co., Inc., Div. of Sperry Rand Corp., 150 E. Aurora St., Waterbury 20, Conn. (VD-Sound powered telephones-NI)

Wheelock Signals, Inc., Long Branch, N. J. (PD)

Mailroom Equipment

ONE OF the places in the office least susceptible to automated techniques in handling work is the mailroom, which deals with information in its physical form. Important because of its function in directing information, it differs from other departments in that it handles information the form of which limits the methods by which it may be processed. Letters of the alphabet do not change their meaning if they are recorded as punched holes, magnetized spots or electrical impulses. But letters, post cards and packages cannot be transformed from one shape to another. Their bulk remains the same.

Limitations in reducing work

The volume of work in a mailroom may be substantially reduced if the form of information sent out of the office is changed before it reaches the mailroom. This may take place if, for example a firm decides to use punched post cards, in its billing procedures. In a case like this, the inserting and folding operations are reduced. But in comparison to other office routines, there are comparatively few ways that mailroom operations can be speeded up to the extent that data handling can be.

Within these limitations, there have been and continue to be improvements made in mailroom machinery and equipment. Of course, there is the obvious factor of increasing the speed of individual pieces of machinery such as collators and folding machines. But the greatest improvement in speed is gained from systematizing the work. This is done in several ways.

One method is to use machines which carry out several functions simultaneously or in automatic succession. It is possible to have one machine which can fold letters, insert them into envelopes, seal them, and imprint postage.

Such a machine eliminates much of the material handling, requires only two loading stations instead of four, and one unloading station where three points would have to be used with separate machines.

But such a machine may not be of advantage in the system employed by a particular firm and it must always be the requirements of the system, if that system is the best possible one, which should govern working procedures, not machinery. One machine doing all these operations instead of individual machines performing these functions separately, may bring about a loss of flexibility and portability when these qualities are needed.

Arrangements to suit work needs

The best arrangements to be made in the mailroom, including the choice of mailroom furniture, are those which permit the smallest number of motions in terms of the volume of mail to be handled.

Mailroom furniture installations may be custom designed to suit particular needs or they may be built up from existing components such as tables, sorting racks, stands, mailbag holders and the like. Units should be chosen on the basis of the volume of the mail

For a quick index to the "Tools of the Office" section see page 72

load, the number of clerks, and the facilities for moving the mail in and out of the office.

There are many differing types of equipment that may be used in mailrooms, depending on the procedures used in different offices. This review will cover, however, only the basic categories.

Collators were not designed to be used only in mailrooms but they do

CADM rotary collator has Lap-Raks so that operators can use both hands for gathering. Picture courtesy of Wadsworth Mfg. Co.

serve a very important and useful function there as well as in duplicating centers and other office work areas. There are a great many varieties of collators.

The simplest form of collator is a rack or bin in which stacks of pages may be placed to be collated by hand. This form may be made more elaborate by the addition of a feeding mechanism. The feed, usually of the friction type, moves the top sheet out of each bin so that it may be gathered by hand, although the feeding device itself may be operated by either manual or electric power.

The bins may be arranged in a great variety of ways. In some types of collators, pages are stacked at stations where the top sheets may be lifted from the stacks by suction feeds. They are then placed in some type of conveyor system which advances the completed stacks and then puts them into a final stacking position.

Some collators have the stations arranged vertically while there are still other types which use a rotating bin-type arrangement. With the latter type, the bins are placed around an axis which may allow for either vertical or horizontal rotation. With this type, either manual or mechanical feeding is available.

Devices may increase functions

The addition of certain accessories can give collators greater versatility. There are devices for folding, stitching, stapling and offsetting sets of papers. Counters are often provided and many models are equipped with safety devices that stop the machine if a page should fail to load, if double-loading occurs, or if a blank page turns up in a stack.

Certain types of gathering racks are also considered as collators because they are used for the same purpose. These gathering racks fulfill the function of holding the various stacks while they are gathered manually.

Envelope opening machines generally operate by the simple process of trimming a small edge off one side of the envelope. These machines may be operated manually, but electric models

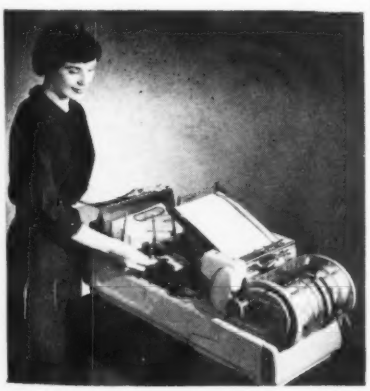
are popular since these are capable of opening an immense number of envelopes in a short time. The amount of material trimmed off can generally be regulated by a simple adjustment of the machine. To avoid cutting into material contained in the envelopes, a jogging device can be used to shake all material to the bottom of the envelope.

Envelope sealing machines vary in their complexity. Some may be simple devices which moisten the envelope flaps and move the envelope between rollers to press it closed. Certain models of these machines may also apply postage stamps, while more elaborate sealing machines are electrically operated and are part of relatively complicated equipment which also prints postage and performs other mailing operations.

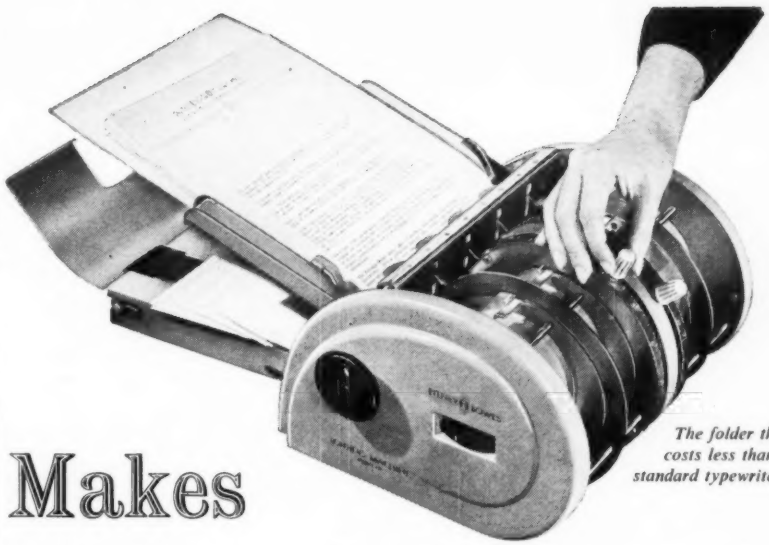
Folding and inserting units are considered together although they carry out two distinct operations because many of the models on the market today accomplish both functions. The folding equipment, regardless of whether it is operated by manual or electrical power, can make a variety of standard folds. These can be selected by making relatively simple adjustments provided for on the machines.

Inserters gather material

The main duties of the inserting machines involve the gathering of materials for insertion into envelopes. The simplest of these machines insert only one item, but larger models may gather inclosures from a number of stations, inserting complete sets. The very complicated machines will not only fold,



Folding machine can make eight different types of folds. Picture courtesy of Pitney-Bowes, Inc.



The folder that costs less than a standard typewriter!

Makes folding fast & easy!

This small, light folding machine does away with the drudgery of hand folding and interruptions to office routines—soon pays for itself with only occasional use.

The Pitney-Bowes FH, with semi-automatic feed, double-folds up to 80 letter sheets a minute. (With fully automatic feed, at slight extra cost, it is even faster.) Makes eight different folds. Set it for fold widths wanted by merely moving two knobs. Takes most standard weights and finishes of paper, from 3 by 3 up to 8½ by 14 inches. It even folds sheets stapled together! Can be used by anybody, and costs less than a standard typewriter.

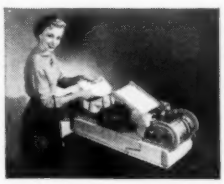
Call the nearest Pitney-Bowes office for a demonstration. Or send coupon for free illustrated booklet.

FREE: *Handy desk or wall chart of new postal rates with parcel post map and zone finder.*

The larger model FM, fully automatic, can fold up to 19,000 sheets an hour.

PITNEY-BOWES
Folding & Inserting Machines

Made by the originator of the postage meter . . . offices in 107 cities.



NEW!
PB's 3300-FH combined folder-inserter folds and stuffs 500 bills, letters, etc. in envelopes in 8 minutes! By itself, the 3300 hooks onto any PB folder, or can serve as an inserter alone.

PITNEY-BOWES, INC.
2910 Walnut St., Stamford, Conn.
Send free ☐ *booklet on PB folding and inserting machines;* ☐ *Postal Rate Chart*
Name _____
Address _____

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gather and insert the material, but also incorporate postage metering facilities and sealing and stacking features. These machines can carry out the complete mailing operation once the original material has been prepared and addressed.

Postage metering machines print postage directly onto envelopes or onto gummed labels or strips which can then be placed on packages, envelopes, and other mailing pieces.

Printed postage Government controlled

Because printed postage has monetary value, it is controlled by the Government under strict regulations. The meter may be set only at a post office. The postage is purchased in advance at the post office and the amount paid for is set into a locked meter in the machine. As postage is printed, the value is subtracted from the amount in the meter.

The equipment is designed so that the metering mechanism can be taken to the post office. In all but the smallest machines, the metering mechanism is made detachable. In addition to printing postage, such machines also print a dated postmark, and, if desired, some form of postmark advertising.

The smallest machines are hand operated and may be used economically by small offices. Larger models may be equipped with automatic loading features, and machines which handle other operations such as folding, inserting, sealing and stacking, may also have postage metering facilities.

Postage stamp affixing machines are generally small and designed to apply ordinary postage stamps directly to mailing pieces. This equipment is helpful to companies which do not have postage metering machines. Some large labeling machines and other mailing equipment may have an accessory feature which will permit postage to be affixed to material ranging in size from post card to catalogs.

Postal scales are offered in many designs and qualities so that the models available differ from each other in a number of ways. One of these distinctions is in the matter of size, with models ranging from small letter scales to those designed to weigh large parcel post packages. A scale's accuracy is also an important factor since too high a reading results in unnecessary postage costs while a reading which is too low will result in postage-due letters. This can create annoyance as well as bad public relations.

Weighing methods vary

Scales differ also in the method used for weighing. Some use springs in various arrangements and others use the principle of gravity through a method of balancing. Indicators also vary in arrangement, in the type of information carried, and in legibility.

Some indicators may be calibrated to show simple weights or postage requirements for only a single mail rate. More informative types will show postage required in the several mail classes for various zones.

Variations of arrangement of indi-

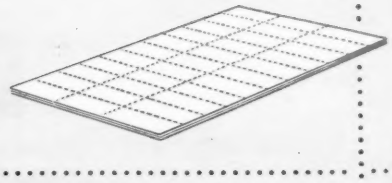
Another example of the folding machines available is this electric model by the Davidson Corp.

You can fill all your multiple mailing needs with

the Dennison Line of Addressing Labels

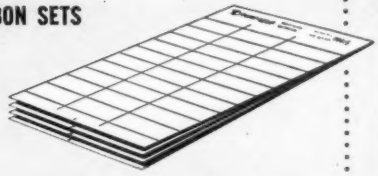
SHEETS

The standard addressing label — for typing or duplicating. 33 pin-perforated labels (2 1/16 x 1") on 8½ x 11" sheet. No lint; no pods. Type 33 labels with one insertion. White, blue, buff, salmon, canary, cherry, green. In 25 sheet or ream packages.



4-PART SNAP-APART CARBON SETS

For follow-up mailings, use Dennison Carbon Set Labels — 4 sheets of couponed label paper collated with 3 sheets of one-time carbon. Quick, clean, easy. Labels stay lined up until snapped apart. 33 labels (2 1/16 x 1 1/16") on a sheet. White only.



ROLLS

Dennison Addressing Labels come in continuous rolls of 1000 couponed labels, 3 x 1" or 3 x 1½", in a dispensing box. Accurate spacing allows labels to be typed with a minimum of adjustment. White only.

Dennison quality labels plus special Dennison gumming insure satisfaction.

Order Dennison Addressing Labels from Your Stationer.

Dennison
Framingham, Mass.

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cator and chart include the type of scale which has an indicator moving back and forth across a fan-shaped chart. Other types have the chart wrapped about a rotating drum with a fixed hairline indicator. Some models have a "gunsight" indicator so that only the desired portion of the indicator is exposed to view at one time. This feature is designed to protect the user against reading the wrong scale inadvertently, if the chart contains information for various classes of mail.

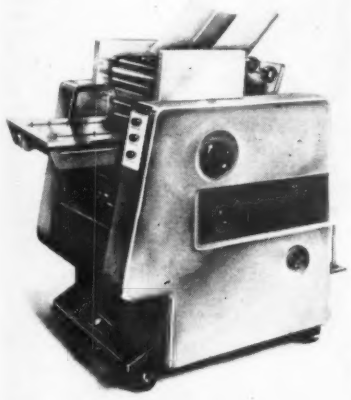
Mailroom furniture and miscellaneous equipment includes any furniture and equipment that enables the mailroom staff to carry out its duties.

The furniture items usually consist of sorting bins, racks, tables, stands and cabinets. Miscellaneous items that could conceivably be used in the mailroom are impossible to list in entirety but items such as mailbags and mailbag holders, tape dispensers, mail carts, labeling machines and counting machines are among the most common of these accessory units.

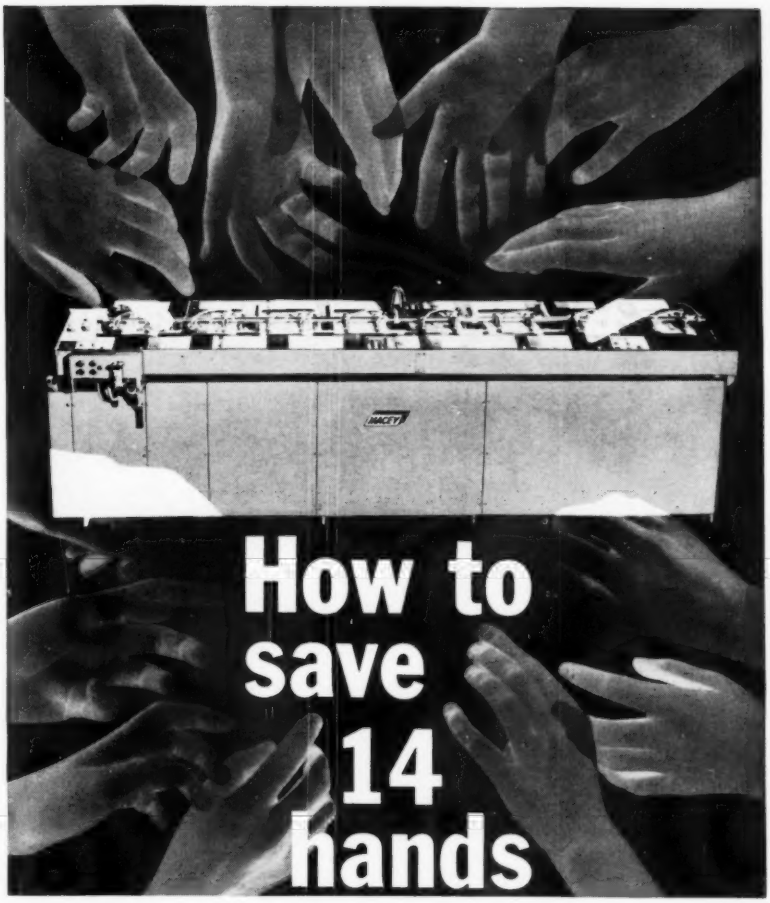
The Manufacturers

The list below is devoted to manufacturers of the principal types of mailing equipment, plus some equipment which, while not always used in the mailing room, may properly be grouped here. Because of space restrictions, the list is limited to basic categories of equipment, which are indicated by the following codes:

C—Collators.



Office Dynamics Corp.'s "Automailer" is electric machine which integrates functions of folding, nesting, inserting and sealing.



Macey Collator lets one girl do the work of 8... pays for itself in months!

Keep the skilled hands in your office on work that pays . . . not on time-stealing paper-stacking chores. A standard eight-station Macey Collator and one girl can gather 32,000 sheets per hour — that's 8 times faster than hand-gathering and far more accurate.

It handles anything from onionskin to cardboard, and an automatic detector insures 100% accurate sets. Choose from 16 models, handling sizes from 3 x 5″ to 12 x 17″.

FREE JOB STUDY FOR YOUR PLANT OR OFFICE!

Want to know your collating costs (including *hidden* costs)? We'll do a free survey of your plant or office without interrupting work schedules. Write today, no obligation.

HARRIS INTERTYPE CORPORATION

MACEY COMPANY

A Subsidiary of Harris-Intertype Corporation

13835 Enterprise Avenue, Cleveland 35, Ohio

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E—Electric machines.

EOS—Envelope opening and sealing machines.

F—Furniture other than sorting racks and bins.

FI—Folding and/or inserting equipment.

M—Manual machines.

MI—Miscellaneous.

NI—No information available at press time on current products.

PM—Postage metering machines.

PS—Postal scales.

B-T Co.'s "Mite" scales are available for letters and parcel post with scales showing rates for various zones.

Tools of the Office

SA—Postage stamp affixing machines

SD—Sorting bins and devices of use in the mailroom.

Addressograph-Multigraph Corp., 1200 Babbitt Rd., Cleveland 17. (C-E-NI)

Amberg File & Index Co., 1627 E. Duane Blvd., Kankakee, Ill. (SD)

Associated Industrial Designers, 3726 Effingham Place, Los Angeles 27. (SD)

B-T Co., Inc., 121 N. Broadway, Milwaukee 2. (PS)

Barwel Mfg. Co., 95 Commercial St., Brooklyn 22, N. Y. (MI-Mail bags)

Bell & Howell Phillipsburg Co., U.S. Route No. 22, P.O. Box 186, Phillipsburg, N. J. (FI; E; PM-E-NI)

Bemis Bro. Bag Co., 408 Pine St., St. Louis 2. (MI-Mail bags)

Better Packages, Inc., 252 Canal St., Shelton, Conn. (EOS-M; MI-Tape dispensers and labelors)

The Bircher Co., Inc., 192 Mill St., Rochester 4, N. Y. (EOS-E, M-NI)

Bohn Duplicator Corp., 444 Fourth Ave., New York 16. (EOS-M)

The Borg-Erickson Corp., 1133 N. Kilbourn Ave., Chicago 5. (PS)

Boyle Leather Goods Co., Inc., 36 E. 31st St., New York. (MI-Mail bags)

Can-Pro Corp., 19 E. McWilliams St., Fond du Lac, Wis. (MI-Mail bags and distributing cases)

Cel-U-Dex Corp., P.O. Box 1127, New Windsor, Newburgh, N. Y. (MI-Label holders; SD)

W. A. Charnstrom Co., 422 S. 7th St., Minneapolis 15. (MI-Mail bag holders)

John Chatillon & Sons, 85 Cliff St., New York 7. (PS-NI)

Cheshire, Inc., 1644 N. Honore St., Chicago 22. (EOS; MI-Labeling equipment; SA)

Chesley Industries, Inc., 24777 Telegraph Rd., Detroit 41. (MI-Mail carts)

The Collmatic Corp., Wayne, N. J. (C-E)

Cooks' Inc., 207 Lakeview Ave., Blackwood, N. J. (SD)

Corbin Wood Products Div., The American Hardware Corp., P.O. Box 1324, New Britain, Conn. (F; SD)

Cummington Corp., 718 Beacon St., Boston 15. (C-E; FI-E; PS)

Cummins-Chicago Corp., 4740 N. Ravenswood Ave., Chicago 40. (MI-Mail marking equipment)

Mail Cart!

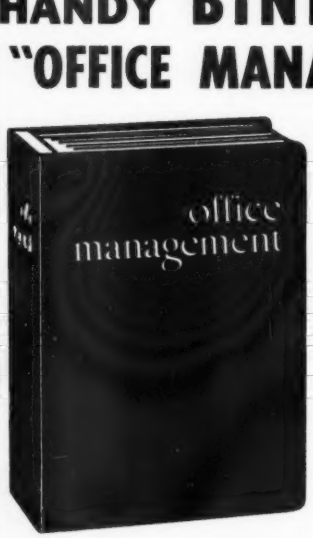
Put efficiency in your mail operation! This double-deck polished aluminum mail cart by Chesley lets your mail department categorize incoming mail for quick, error-free delivery. Lower basket for out-going mail. Both baskets are removable.

BASKET SIZE—(Upper) 17½x25x11; (Lower) 17½x25x8
FRAME—High Polished Aluminum • BASKETS REMOVABLE
SHIPPING WEIGHT—33 lbs. • PRICE—$45.00 • TERMS 1% 10 days, net 30 days • F.O.B. Detroit.
File folders to fit guide bars — $.24 ea.

Write for free brochure — or, better still — order today!

Chesley Industries, Inc.
24777 Telegraph Road, Detroit 41, Mich.

HANDY BINDER FOR "OFFICE MANAGEMENT"



Protect your copies of OFFICE MANAGEMENT with these modern Vulcan Binders! Each binder holds six monthly issues and the annual YEARBOOK issue of OFFICE MANAGEMENT. Binders are made of heavy-weight board and are covered with dark blue, drill quality, imitation leather stamped in gold foil as illustrated. Backbone panel gives space for labeling volume and year. Individual wires hold each issue securely, make insertion easy.

Single Binders $3.00 Postpaid
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Enclose check with order

OFFICE MANAGEMENT
The Magazine for Management Executives
212 Fifth Avenue New York 10, New York

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Currier Mfg. Co., 2448 W. Larpenteur, St. Paul 13. (SD)

The Darling Payne Corp., 82 Beekman St., New York 38. (MI-Counting machines-NI)

Davidson Corp., 29 Ryerson St., Brooklyn 5, N. Y. (FI-E)

Dependable Mfg. Co., 2407 Ft. Crook Rd., Bellevue, Neb. (F-Stools)

Derby Sealers, Inc., 100 Seymour Ave., Derby, Conn. (MI-Tape dispensers-NI)

Detecto Scales, Inc., 540 Park Ave., Brooklyn 5, N. Y. (PM; PS)

A. B. Dick Co., 5700 W. Touhy Ave., Chicago 31. (FI-E)

The Dick Mailer Co., 137 W. Tupper St., Buffalo 1, N. Y. (MI-Labeling machines)

Didde-Glaser, Inc., 50 Hi-Way and E. Twelfth Ave., Emporia, Kans. (C-E)

Equipto Div., Aurora Equipment Co., 422 Cleveland, Aurora, Ill. (F; SD)

Evans Specialty Co., Inc., P.O. Box 8128, 1800 E. Grace St., Richmond, Va. (C-M; MI-Moistener aid in sorting and counting)

The Federal Equipment Co., P.O. Box 446, Carlisle, Pa. (F-NI; MI-Mail bags and racks-NI; SD-NI)

Friden, Inc., 2350 Washington Ave., San Leandro, Calif. (EOS-E, M; E; MI-Mail bags, tables, mailbag holders, distributors; PS; SA; SD)

J. L. Galef & Sons, Inc., 85 Chambers St., New York. (PS-NI)

A. Galewski & Sons, Inc., 119 W. 25 St., New York 1. (MI-Mail bags-NI)

The General Fireproofing Co., 413 Dennick Ave., Youngstown 1, Ohio. (SD)

General Photo Products Co., Inc., 15 Summit Ave., Chatham, N. J. (C-M, for photocopying work-NI)

Glue-Fast Equipment Co., Inc., 9-11 White St., New York. (MI-Tape dispensers, labeling machines-NI)

Graphic Arts Development Co., 3812 W. 150 St., Cleveland 11. (C-NI)

Hamilton Specialties, Inc., 5 Watson St., Boston 18. (PS)

Hanson Scale Co., P.O. Box 267, Northbrook, Ill. (PS-NI)

Harris-Seybold Co., 4510 E. 71 St., Cleveland 5. (C-E)

Hartman Metal Fabricators, Inc., 133 Murray St., Rochester 6, N. Y. (SD)

Haskell, Inc., 303 E. Carson St., Pittsburgh 19, Pa. (F-NI)

S. A. Hirsh Mfg. Co., 8051 Central Park Ave., Skokie, Ill. (MI-Shelving-NI)

The Howe Scale Co., 2947 Scale Ave., Rutland, Vt. (PS-NI)

A. C. Hummel Co., 5349 Kennedy Ave., Cincinnati 13. (MI-Tape sealers and moisteners)

I. D. L. Mfg. & Sales Corp., 132 Lafayette St., New York 13. (PS)

Ideal Stencil Machine Co., 102 Iowa Ave., Belleville, Ind. (MI-Tape dispensers-NI)

Industrial Molded Products Co., Inc., 609 New York Bldg., St. Paul 1, Minn. (EOS-NI)

One of Thomas Collators' line of collators is this desk-top electric model which is operated by a switch.

the NEW Thomas "Desk-Top" Collator

Now for the first time a completely electric collator that is priced within the reach of every office . . . actually *half the price* of anything on the market. Yet, this new Thomas has the capacity to handle 8½ x 11 sheets of most tissue, onionskin, one-time carbon, bond, mimeo and even ⅛" cardboard. It's portable, light weight and extremely simple to operate. A flip of the switch and the tiresome time-consuming task of gathering pages into sets becomes an efficient, effortless job . . . *that's almost fun!*

Mail coupon . . . or ask your own stationer or office equipment dealer to make arrangements for a free demonstration.

THOMAS COLLATORS INC.

Thomas Collators Inc.
Dept E 50 Church Street, New York, N.Y.

☐ Sounds good . . . send literature!
☐ I'd also like a free demonstration.

NAME _____ (please print)
COMPANY _____
ADDRESS _____
CITY _____ STATE _____

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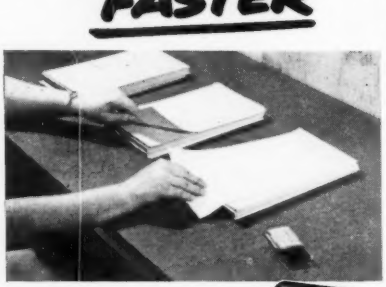
new PORTABLE
MAILBAG HOLDER
Speeds Handling - Lowers Costs

EASY TO
LOAD — MOVE — UNLOAD

Write for details:
W. A. CHARNSTROM CO.
422 So. 7th St. Minneapolis 15, Minn.

SORT FASTER



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...WITH
SORTKWIK®

The non-allergenic fingertip preparation
Eliminates irritating rubber fingers... messy, unsanitary sponges

Easy to use—just apply to fingertips for greaseless, stainless, tacky film. Pick up papers easily, quickly.

Non-drying—contains no drying alcohol.

Non-allergenic—Recommended by dermatologists.

Long-lasting—attracts moisture to fingers, making one application long lasting.

Widely used—Thousands of businesses speed up sorting, counting, filing, posting with SORTKWIK.

Your Stationer has SORTKWIK or will stock it for you. Only 50c each.

MAIL COUPON FOR TRIAL OFFER
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Dept. OM-1, 2716 Lyndale Ave. So.
Minneapolis 8, Minnesota
Enclosed is $1.00 for two trial containers of SORTKWIK.
Name_____
Company_____
Address_____
City_____ State_____

Tools of the Office

Insert-O-Matic Corp., 1707 N. 25 Ave., Melrose Park, Ill. (FI-NI)

Interior Steel Equipment Co., 2352 E. 69 St., Cleveland 4. (F-NI; SD-NI)

Jayem Sales Corp., 31 Coffey St., Brooklyn 31, N. Y. (SD)

Johnson Research Corp., Bethpage, L. I., N. Y. (C-NI)

Ketcham & McDougall, Inc., 465 Eagle Rock Ave., Roseland, N. J. (MI-Tape dispensers-NI)

Lansdale Products Corp., Box 568, Lansdale, Pa (EOS-E; FI-E; MI-Cutter and perforator to make up odd-size cartons from flat stock)

LeFebure Corp., 716 Oakland Rd., N.E., Cedar Rapids, Iowa. (SD-NI)

W. C. Leute, 54 Dey St., New York 7. (MI-Mail bags-NI)

Macey Co., 13835 Enterprise Ave., Cleveland 35. (C-E; FI-E)

Arnold MacKenzie, 3133 Overbrook Drive, Minneapolis. (EOS-NI)

Mail-O-Matic Corp., Beverly Hilton Hotel, Beverly Hills, Calif. (FI-E, M-NI)

Marsh Stencil Machine Co., 82-C Marsh Bldg., Belleville, Ill. (MI-Gummed tape dispensers)

Martin-Yale, Inc., 2100 W. Fulton St., Chicago 12. (EOS-E; FI-E)

Master Folder Co., 3000 Woodhill Rd., Cleveland. (FI-NI)

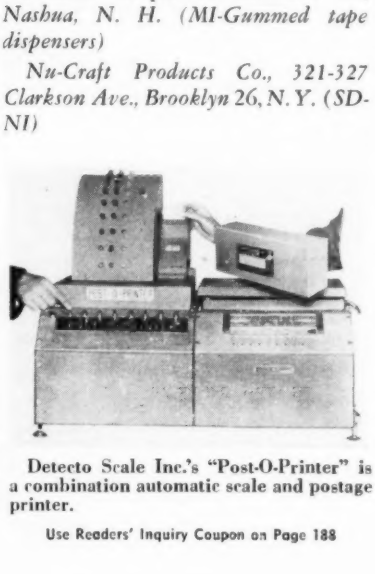
The Mayfair Co., 315 N. Desplaines St., Chicago 6. (PS-NI)

J. Curry Mendes Corp., 1 Curry Lane, Canton, Mass. (C-E; FI-E)

Metal Specialties Mfg. Co., 1975 N. Cornell Ave., Melrose Park, Ill. (MI-Tape dispensers-NI)

Nashua Corp., 44 Franklin St., Nashua, N. H. (MI-Gummed tape dispensers)

Nu-Craft Products Co., 321-327 Clarkson Ave., Brooklyn 26, N. Y. (SD-NI)



Detecto Scale Inc.'s "Post-O-Printer" is a combination automatic scale and postage printer.

Office Accessories Corp., 660 S. Fair Oaks Ave., Pasadena 2, Calif. (EOS-M-NI; MI-Tape dispensers-NI; SA-NI)

Office Dynamics Corp., The Beverly Hilton, 9876 Wilshire Blvd., Beverly Hills, Calif. (EOS-E; FI-E; PS; SD)

Pelouze Mfg. Co., 1218 Chicago Ave., Evanston, Ill. (PS)

Pitney-Bowes, Inc., Walnut & Pacific Sts., Stamford, Conn. (C-E; EOS-E, M; F; FI-E; MI-Counting and imprinting machines; PM-E, M; PS; SD)

Permacel Tape Corp., New Brunswick, N. J. (MI-Tape dispensers)

Pres-to-Line Corp. of America, 2339 Cotner Ave., Los Angeles 64. (EOS-M)

The Print-O-Matic Co., Inc., 724 W. Washington Blvd., Chicago 6. (EOS-E; FI-E)

The Recordplate Co., 16 E. Holly St., Pasadena 1, Calif. (SD)

Remington Rand, Div. of Sperry Rand Corp., 315 Fourth Ave., New York 10. (C-M-NI)

Rex-Rotary Distributing Corp., 387 Fourth Ave., New York 16. (FI-E, M-NI)

Royal McBee, Westchester Ave., Port Chester, N. Y. (MI-Portable spirit type duplicator which reproduces fixed information such as addresses on envelopes)

Rudson-Wood, Inc., 15 W. 44 St., New York 36. (PS)

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5 Tray & Base..$7.50		5 Tray & Base..$9.50

CURRIER MFG. CO., INC. 2448 W. Larpenteur St. Paul 13, Minn.

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Salsbury Corp., 1161 E. Florence Ave., Los Angeles 1. (MI-Tape dispensers-NI)

Seal-O-Matic Dispenser Corp., 169 Murray St., Newark 5, N. J. (EOS-M; MI-Tape dispensers)

The Sorter-Graf So., 4044 W. Jefferson Ave., Detroit 9. (SD)

Speed-O-Print Corp., 1801 W. Larchmont Ave., Chicago 13. (EOS-E)

Speedo-Sort Co., 2643-B N. Cicero Ave., Chicago 39. (SD)

Standard Duplicating Machines Corp., 1935 Parkway, Everett 49, Mass. (EOS-E, M)

Standard Pressed Steel Co., Columbia-Hallowell Div., Box 919, Jenkintown, Pa. (SD)

William W. Stanley Co., Inc., 401 Broadway, New York 13. (MI-Mail bags-NI)

Syntron Co., 715 Lexington Ave., Homer City, Pa. (MI-Joggers)

Tape, Inc., 1706 S. Broadway, Green Bay, Wis. (MI-Tape dispensers-NI)

Thomas Collators, Inc., 50 Church St., New York 7. (C-E, M)

The Toledo Metal Furniture Co., 1400 Hastings St., Toledo 1, Ohio. (F; MI-Trucks)

Toledo Scale & Mfg., 1083 Telegraph Rd., Toledo 1, Ohio. (PS-NI)

Triner Scale & Mfg. Co., 2714 W. 21 St., Chicago 8. (PS)

U. S. Luggage & Leather Products Co., 29 W. 34 St., New York 1. (MI-Mail bags-NI)

The Victor Safe & Equipment Co., Inc., 315 Fourth Ave., New York 10. (SD)

The Wadsworth Mfg. Co., P.O. Box 125, Wadsworth, Ohio. (C-E, M)

Weber Marking Systems Div., Weber Addressing Machine Co., Inc., 215 E. Prospect Ave., Mount Prospect, Ill. (MI-Label printing machines)

Werner Canvas Products Co., 110 New York Ave., Brooklyn 16, N. Y. (MI-Mail bags-NI)

Wilson Jones Co., 209 S. Jefferson St., Chicago 6. (EOS-M)

Chauncey Wing's Sons, 78 Pierce St., Greenfield, Mass. (MI-Label affixing machines)

Yawman & Erbe Mfg. Co., Inc., 1099 Jay St., Rochester 3, N. Y. (F; SD)

Zephyr American Corp., 95 Morton St., New York 14. (EOS-M)

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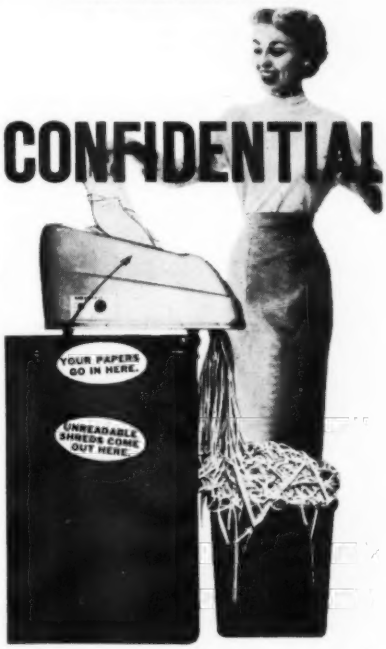

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Microfilm Equipment

TODAY, MICROFILM is a very much accepted "tool of the office." A little more than twenty-five years ago, it was unheard of except as a device developed originally to give banks a record of checks passing through their hands. But now, in keeping with the current trend to emphasis on systems rather than machines, microfilm equipment has become an integral part of office procedures. It has helped solve problems caused by increasing numbers of records, by time consuming descriptive billing, by loss and deterioration of records, and inaccuracies because of multiple posting.

Microfilming saves time and money

The savings in time and money which microfilming equipment makes possible are the result of four basic facts about the microfilm camera. One, it is the fastest of all copying devices used in the office, making exact copies at speeds of thousands per hour. Two, it is the least expensive office device for making exact individual copies, measured by its operating costs, the film being much less expensive per copy than any other type of copying medium. Three, microfilm images are the smallest of all records which must be read in the office. And last, microfilming techniques permit records to be either maintained sequentially or individually, owing to the development of many means for "unitizing" microimages.

These factors, plus the medium's adaptability to paper filing systems, the availability of machines to produce positive prints from the film in a matter of seconds and the appearance of portable equipment, also account for its rapid growth as a systems tool.

Record retention is, of course, one of the most important applications of microfilm equipment. Condensing records in microscopic form saves space, preserves records, and allows easy transportation of recorded information. The big impetus for recording records on microfilm came about with the advent of the atomic bomb when some fast, accurate and economical way was needed to duplicate documents which were considered vital to a firm's existence.

Many microfilming applications

Other applications of microfilming fall under the heading of procedural microfilming which operates on three main principles. The data transmission principle is used when the same information must be kept on record in a main office and also sent to various points outside the office. The moving document principle is used when any record is microfilmed so that the information it contains can be recorded at

Film is loaded into the magazine of Diebold, Inc.'s twenty-pound portable microfilm camera.

a certain point and then sent on to another point for further processing. The "freezing of a changing record" principle is used when information must be taken by one department from records which are constantly changing, or records which must be processed by another department.

Procedural microfilming beneficial

The applications of these principles are seen when department stores and utility companies send back the original sales slips to customers with the monthly statement after the records of the transactions are microfilmed for main office files. Supermarkets protect themselves and their shoppers in case of fraud or loss of checks, as well as speed up service, when they microfilm the checks and identifying information of their customers. And when accounts receivable ledgers are filmed to establish schedules of these accounts, procedural microfilming is used again.

One of the problems encountered in establishing a routine for microfilm records is how to index the material so that it may be located quickly. Microfilm records may be kept in several ways: (1) as images on a roll of film, in the sequence in which they were filmed, (2) as "unitized" images, with single frames or short strips of several frames mounted in cards and filed in any desired order and (3) as opaque records which may be actually printed onto a card so that a complete file on one subject can be filed together.

"Unitized" form useful

Aside from the increasing use of microfilm equipment in all phases of clerical work, a particular current trend is the greater use of the "unitized" form, especially for engineering drawings and data. The unitized form is a single microfilm frame or a small group of such frames which are cut out of the original roll and filed together or in whatever sequence is most useful. Filling systems utilizing the unitized opaque form parallel the indexing methods of those used in filing original documents. One additional technique, and this too is currently being more widely used, is to insert the frames into apertures in tabulating cards which allows all of the sorting and tabulating capabilities of the punched card equipment to be added to the record system.

Positive opaque prints can also be affixed to such cards. Readers are available which can make full-sized prints from the unitized forms of microfilm through the use of dry photographic copying techniques such as xerography and diazo so that the unitized microfilms become a master rather than just a copy of the original documents.

When microfilmed records are to remain on the original roll on which they were recorded, more care must be given to their indexing. Successful indexing will occur if care is taken in planning the sequence of filming and in following certain simple indexing principles which closely parallel those used in conventional filing cabinets.

Indexing of film important

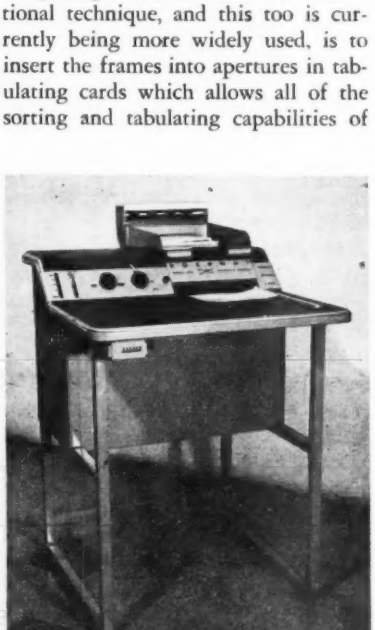
Microfilm is traditionally stored in boxes which carry a space on the edge which can be used to indicate the same information that might be carried by the labels on file drawers. Thus, the primary indexing information recorded on the edges of the boxes is readily visible when placed in the file drawer.

Spaces are provided on the side of each box so that subdivisions of the categories so indexed may be written down. Information recorded here may include the number or name of the first and last items recorded on the reel, together with the numbers of items adjacent to "flashers" used within the roll to identify subdivisions made during the recording. The information recorded on the side of the box represents subdivisions that correspond to those represented by file guides and sub-guides, such as are used in standard file drawers.

Thus, given the number or name of any record filed sequentially, the roll of film containing it may be quickly located by checking the edge of the box and then the side of the box.

Flashers used within the film to indicate the major subdivisions are just portions of the film conspicuously different from portions containing records. They are made so outstandingly different from the rest of the film so that they may be spotted quickly as the film runs through the reader at high speed.

Strips of white paper such as adding machine tape may be used as flashers, and inserted into the camera at appropriate intervals during the filming of records. They may be placed in the film



Documents are brought back to the operator in their original order with flow type camera developed by Documat, Inc.

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to mark the location of key records or key numbers if a numerical system is used. If the number of flashers on a roll is indicated on the side of the box, together with the identification of adjacent records, then the viewer may find the approximate location of a wanted record by simply counting the flashers as the film moves through the reader.

"Targets" another indexing device

"Targets" are another device used to provide additional information about records on roll film. Targets are meant to be read while the film is moving slowly or stopped, as contrasted to the flashers which are meant to be seen and understood, while the film is moving at a rapid pace. Key words such as "START" or "END" and sometimes detailed indexing information on the material in the roll of film are printed on the targets.

Another means of indexing, other than flashers, is the recording of key items with reference to the number of feet of film that must be run to come to them. The particular reader used is equipped with a meter which shows the number of feet run; if the material is properly indexed, the meter may be used to locate the desired material.

Obviously, documents in film form must be usable in some predetermined sequence, such as numerical, alphabetical or chronological order. A film which is cut, rearranged and spliced may suffer as far as its legal value is concerned if the sequence of recording is important. Otherwise, microfilm is considered legal evidence of the documents recorded, and, if the sequence does not matter, rearrangement or unitizing of the film may allow for special advantages in the filing system.

Basic equipment for microfilming use consists of the camera and the reader. There are two types of cameras. The flow camera is used commonly to record documents in the office and gets its name from the fact that records are photographed while both film and documents are moving through the camera. Synchronization of the speeds of the film and the document are made so that the leading edge of the document is filmed as it passes a certain point in the machine and each successive portion of the document is filmed as it passes this same point. The flow method is extremely fast, and can accept thousands of documents an hour. It cannot, however, accept pages from bound material unless the pages are removed.

Transport or "planetary" cameras are the second basic type of microfilm cameras, and the method used with these units more closely resembles methods used with the ordinary camera since the entire document is photographed at once. Microfilming with transport cameras is a much slower process than with the flow-type units, as each item must be placed before the camera individually and removed after the photograph has been taken. Transport cameras are not adapted to rapid feeding of records and are used primarily for recording large documents such as engineering drawings and blueprints. Some large documents, however, can be recorded with flow-type cameras if the cameras have extremely wide throats. The transport type camera, in contrast to the flow type, can be used to record bound material.

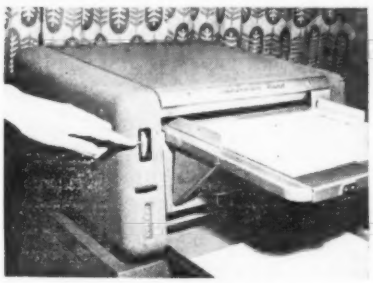
Many camera models offered

Microfilm cameras generally use 16mm or 35mm film, some models accepting either size, but office units which will accept 70mm film or larger, while rare, are available.

Some models will record one side of a document at a time with the image occupying the full width of the film while other models can record on half the film width as well. In some machines "duplex" recording is possible, in which both sides of a document are filmed at once, with their images appearing side by side on the film.

Another factor that must be understood in the microfilming process concerns reduction ratios. By providing differing reduction ratios it is possible to make cameras adjust to documents of various sizes. Some models have fixed ratios which cannot be changed, or, if they can be, it may be done at the factory. Other cameras are designed so that the ratios may be changed by changing the lenses. Usually the worker can do this by operating a simple mechanism in which the lenses are mounted.

Copies of microfilm are produced in 8 seconds with Thermofax Microfilm Reader-Printer of Minnesota Mining & Mfg. Co.



Remington Rand's Model 8.1 microfilm camera utilizes built-in volt meter for colored documents.

Reduction ratios need care

Care should be taken with the reduction ratios to see that they are suitable to the material being recorded. A large ratio may reduce fine print beyond the point of legibility while a small ratio may result in wasting film space.

Manual or automatic feed or both may be used with flow cameras. Automatic feeds are most effective in re-

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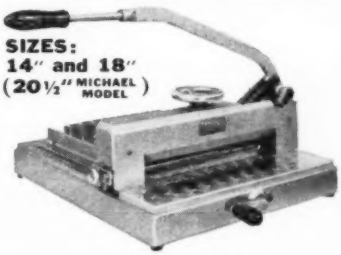

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Manufactured by Bell & Howell and serviced by the Burroughs Corp., the 206 Reader is available in two magnification ratios.

cording documents which are of uniform size, shape and thickness, and which have clean leading edges. When material is being filmed that is not consistent in these respects—such as torn or "dog eared" papers—it is usually best to have the automatic feed operated by a skilled operator who can feed in the items by hand as necessary.

Special protective features such as those designed to prevent double loading, loading when there is a failure of lights or of internal mechanism, and loading when the film has broken or the film supply has been exhausted, are found in many flow cameras.

Varied features on readers

Microfilm readers also vary in their features. Some models throw images onto the reverse of a translucent screen while others use an opaque screen which may or may not be built into the reader.

Various magnification ratios are obtainable, and in many cases these are interchangeable. Some of the features available are facilities for rotating the projected image so that documents recorded sidewise because of their shape and size can be read in the normal position; variability of speed of film through the viewer, and features for making prints from the microfilm images. Manual or electric operation is also provided with the readers. Other viewers are designed to be used with opaque and unitized images, and some readers are offered in a unit combined with a camera.

The equipment comes in varying sizes including portable models which are as small as a typewriter. The portable machines are of great value to procedural microfilming as they enable an operator to take a unit into an office to photograph documents he needs and to take the images to his office for further study. Auditors have found this technique extremely helpful.

In addition to cameras and readers there are many other units used in microfilming work, such as the ones used for processing the film and preparing it for storage. There is a wide range of equipment such as splicers and inserters for unitizing microimages, units to make enlarged prints from microfilm images and other accessories such as microfilm filing cabinets and facilities for dehumidifying the spaces used to store microfilm.

Careful storage required

Microfilm should not be stored in insulated files since such insulation is usually designed to give off moisture in the form of steam when the unit is exposed to great heat as during a fire. The film may be damaged by moisture at temperatures lower than those necessary to ruin it from the direct effects of heat.

Underground vaults are also not recommended because the dampness usually found in them may also adversely affect the film. It is thought best that microfilm be stored in tin cans with friction lids and placed above ground in fire-resistant vaults. If the film is stored in humidified cabinets then a quantity of salt should be kept in the cabinet in excess of that required to saturate the salt solution and the cabinets should be as airtight as possible. Humidity should be maintained within 40 to 50 per cent of saturation.

The economy, compactness and almost unlimited application of microfilming in systems assure the continuing expansion of its use in industry.

UNIprinter "075" copies film in an aperature card onto a blank piece of diazo film. Courtesy of The Filmsort Co.

The Manufacturers

The following list includes the major manufacturers of microfilm equipment. It also includes suppliers of services used in preparing "unitized" microrecords.

The codes in the list are as follows:

C—Cameras.

MI—Miscellaneous.

NI — No information available at press time on current products.

For a quick index to the "Tools of the Office" section see page 72

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A DIVISION OF MIEHLE-GOSS-DEXTER, INC.

RF—Readers using roll film.

RO—Readers for opaque microimages.

U—Supplies and services for unitizing microimages.

Atlantic Microfilm Corp., 28 Railroad Ave., Pearl River, N. Y. (C; MI—Editing unit for film and microfilm cabinets; RO; U)

The American Microfilming Service Co., Microtape Systems, 44 Laura St., New Haven, Conn. (MI — Filing systems for opaque microimages in unitized form; RO; U)

American Optical Co., Instrument Div., Buffalo 15, N. Y. (RO-NI)

Browne-Morse Co., Muskegon, Mich. (MI-firm files)

Charles Bruning Co., Inc., 4700 W. Montrose Ave., Chicago 41. (MI-Enlarger, printer)

Burroughs Corp., 6071 Second Ave., Detroit 32. (C; MI — Readers which make prints or copies from film; RF)

Cook's Inc., 207 W. Lakeview Ave., Blackwood, N. J. (MI — Transparent holders—NI)

Copycat Corp., 41 Union Square West, New York 3. (MI — Units to make prints from filming—NI)

Diebold Inc., Flofilm Div., P.O. Box 127, Norwalk, Conn. (C; RF; U)

Documat Inc., 385 Concord Ave., Belmont, Mass. (C; RF; RO)

Durst (USA) Inc., 770 Eleventh Ave., New York 19. (C; MI—Unit to make prints or copies from film; RF)

Eastman Kodak Co., 343 State St., Rochester 4, N. Y. (C; MI—Enlargers, microfilm, print and positive film, and projection papers; RF; RO; U)

The Filmsort Co., Div. of Miehle-Goss-Dexter, Inc., Pearl River, N. Y. (R; U)

Graflex, Inc., 3750 Monroe Ave., Rochester 8, N. Y. (C)

Graphic Microfilm Corp., 115 Liberty St., New York 7. (C; RF; RO; U)

Griscombe Products, Inc., 133 W. 21 St., New York 11. (C; MI—Reader unit has print making feature; RF; RO; U)

Tools of the Office

Hall & McChesney, Inc., 1233 Oswego Blvd., Syracuse, N. Y. (U-NI)

Haloid Xerox Inc., 2-20 Haloid St., Rochester 3, N. Y. (MI — Microfilm xerographic printers)

F. G. Ludwig, Inc., Old Saybrook, Conn. (MI-Developer for processing enlargements from microfilm)

Microfilm Corp., 13 E. 37 St., New York 16. (C-NI; R-NI)

Microfilming Corp. of America, 2 Llewellyn Ave., Hawthorne, N. J. (C; RF; RO; U)

Microlex Corp., 1 Graves St., Rochester 14, N. Y. (RO-NI)

Minnesota Mining & Mfg. Co., 900 Bush Ave., St. Paul 6, Minn. (MI—Reader which makes prints from microfilm by "Thermofax" process)

Ozalid, Div. of General Aniline & Film Corp., 13 Ansco Rd., Johnson City, N. Y. (C; MI — Readers make prints from microfilm; RF; RO; U)

Peerless Photo Products, Inc., Shoreham, L. I., N. Y. (MI—Flow-type reduction camera)

Photostat Corp., 1001 Jefferson Rd., Rochester 3, N. Y. (C-NI; MI-NI; RF-NI)

Recordak Corp., 415 Madison Ave., New York 22. (C; RF; RO; U)

Remington Rand, Div. of Sperry Rand Corp., 315 Fourth Ave., New York 10. (C; RF; RO; MI—Feeders, film and processors; U)

Security Steel Equipment Corp., Avenel, N. J. (MI-Film file cabinets)

U. S. Microfilm Co., 868 Main St., Stamford, Conn. (C-NI; RF-NI)

Visirecord, Inc., Copiague, L. I., N. Y. (U)

Watson Mfg. Co., Inc., 63 Taylor St., Jamestown, N. Y. (MI-Film storage cabinets)

Yawman & Erbe Mfg. Co., Inc., 1099 Jay St., Rochester, N. Y. (MI-Cabinets)

Typewriters

ONE OF the interesting phenomena of office automation has been the different applications and uses found for many of the older office machines. The typewriter is one of those machines that not only continues to serve its basic function, that of printing neat, clear copy, but has also become one of the most important parts of any highly automated office system.

It is used as a systems machine in accounting, a substitute machine for the expensive typesetting equipment used to prepare printed copy for magazines and books, and a "point of origin" machine for entering information into integrated data processing systems.

Numerous refinements and features have been added to the typewriter so that its traditional abilities and functions have been increased. Some of these refinements include horizontal and vertical halfspacing, simplified setting of margins and tabulation stops, the addition of special keys, and, of course, electrification of machines.

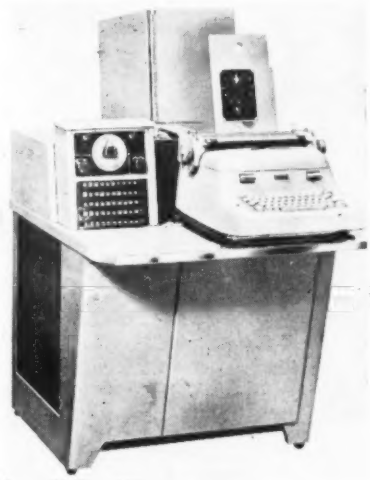
Basic models serve many uses

Several basic types of office typewriters have been on the market for quite some time. These include noiseless machines, machines using carbon ribbons to produce copy of exceptional clarity, long carriage machines intended for statistical work, and electric machines.

In addition to these, several semi-electric models are available. One type features an electric keyboard with manual carriage return while another has a manual keyboard with an electrified carriage return.

There are many other machines that have interesting and useful modifications. One is designed to be used in the preparation of bar graphs and has keys with appropriate designs. Another has embossed codes resembling Braille for the use of the blind, and still another variety of the standard machine is one intended for the use of one-arm typists which eliminates two-hand steps such as typing single capitals.

Other variations have come about



Automatic typing machine stores up to 250 average-sized lines of copy. Picture courtesy of American Automatic Typewriter Co.

in the design of portable machines. An electric portable has been introduced—although it is not fully electrified as it does have a manual carriage return. Another portable features the cartridge approach in changing ribbons. The ribbon is encased in two plastic containers similar to small film magazines and with the use of this, ribbons can be changed without being touched by hand. Some standard machines also have this feature.

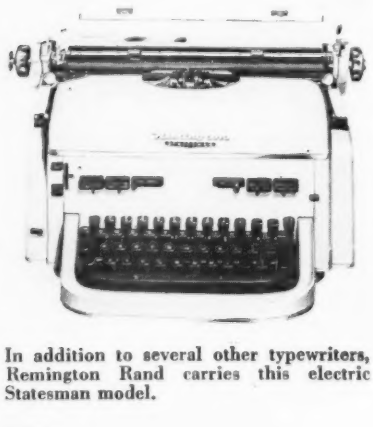
Interchangeable type is now available for some models. With this feature the operator can very easily change the keyboard to permit her to print additional symbols and characters needed in specialized work.

Tabulation made easier

One of the very significant advances that have come about is concerned with tabulation. There is now a feature on some machines which allows a typewriter's tabulating mechanism to sense metallic ink printed on business forms. Forms used with this feature are printed with vertical lines of metallic ink at the left of each box on a fill-in form.

When the electronic sensing feature is used, tabulation is accomplished by pressing a special key. The carriage then moves until the metallic ink line is sensed by a special device and it stops just beyond the line. The typist at this point can make her entry without further tabulation or spacing.

It is no longer necessary, therefore, to set tab stops on machines having this device, as the tabulation setting is accomplished by the business form itself. One of the advantages of this feature is that the typist no longer has the bothersome task of adjusting the carriage to the boxes and therefore her work is more speedily accomplished.



In addition to several other typewriters, Remington Rand carries this electric Statesman model.

Another advantage is that designers of forms gain greater freedom in forms layout. It is no longer necessary for them to group the headings in vertical alignment under the smallest number of tabulation stops that can be used. This means, too, that individual blanks can be given adequate space for the information to be entered without need for space compromises in order to simplify the tabulating problem.

Another typewriter innovation simplifying forms entry has been the variation of the standard typewriter known as the systems machine. This is equipped with a front feed carriage and can be used in a number of bookkeeping applications. The carriage is designed to hold business forms of various types. The machine may be equipped with a device which enables continuous forms to be advanced quickly the proper number of line spaces between successive entries. Systems typewriters fit very well into payroll, accounts payable, accounts receivable and other such operations.

"Justifying" feature available

Many machines are now equipped with a "justifying" feature which evens line lengths so that both margins are in vertical alignment. The typewriters which have this feature are very well adapted for composing type for reproduction and are often supplied with a wide variety of interchangeable type fonts, including italics and special symbols. Because they can handle type in varying sizes and styles they can be used to prepare copy for magazines, small newspapers, announcements, mailing pieces and the like. Copy prepared on this type of machine may be photographed and reproduced in volume by offset or similar methods.

Some machines may be used to control other typewriters so that a typist at one keyboard may turn out several original copies simultaneously. This equipment can also be further adjusted so that only certain portions of the original typing are duplicated by the "slave" machines. A related set of business forms can then be prepared with one typing effort, as the appropriate information can be transferred as needed to the forms typed by the slave machines. This is the same principle used in "one-writing" bookkeeping systems.

Not only can typewriters be controlled by other typewriters but they also can be controlled by automatic devices using perforated rolls like those found in player pianos. Machines using these devices can prepare letters automatically at very high speeds. Form letters may be punched into the master rolls and provisions are made so that the machine will stop to allow a typist to insert variable information such as prices, dates and names.

Automatic controls varied

Some automatic controls are designed for use with rolls containing a selection of paragraphs which can be combined as required to create an individually typed form letter. With these controls, typewriters can be programmed to type only the desired paragraphs; the machine skips over those not being used. One variation of this occurs when a pair of rolls is used to control one machine. This permits alternate paragraphs to be typed from each roll. This is of great advantage in high volume work, because as one roll advances the other controls the typing, eliminating the time required for a machine to skip over material not used.

With automatic typing, one operator can operate two or more machines, synchronizing her work so that she can make manual fill-ins on the machines at the right time, and remove and enter letters from the machines at the right intervals. Sometimes it is possible for an operator to handle as many as four or five machines at one time.

One of the most important modifications to the typewriter in recent years has been the addition of devices which enable it to read and/or punch

Everest model offered by Alma Office Machine Corp. includes automatic paper injector and ejector.

ELECTRIC TYPEWRITER COMPARISON CHART

	SMITH-CORONA	Brand A	Brand B	Brand C	Brand D
AUTOMATIC MARGINS Simple one-hand, one-step operation.	YES	NO	NO	YES	NO
SIGNAL LIGHT Positive visual indication if motor is ON or OFF.	YES	NO	NO	NO	NO
TOTAL TABULATOR CLEAR Clears all stops instantly without moving carriage.	YES	NO	NO	NO	NO
ERROR CONTROL Simplifies correction of errors and line justification.	YES	NO	NO	NO	NO
BOTTOM MARGIN INDICATOR Page Gage accurately indicates bottom margin.	YES	NO	NO	YES	NO
88 CHARACTER KEYBOARD Standard at no extra charge.	YES	NO	YES	NO	YES
KEYBOARD SLOPE Key top slanted to fit natural movements of fingers.	YES	NO	NO	NO	NO
ROLL-FREE ACTION Releases typebar cams with no "scuffing" action.	YES	NO	YES	NO	NO
SAFETY COVER Motor shuts off when cover is raised to change ribbon.	YES	NO	NO	YES	YES
CUSHIONED TOUCH Eliminates jar to sensitive finger tips at end of each stroke.	YES	NO	NO	NO	NO
THE WORLD'S FASTEST ELECTRIC TYPEWRITER	YES	NO	NO	NO	NO

DECIDE FOR YOURSELF!

Before you buy, compare Smith-Corona with any other electric typewriter made!

Feature for feature, point for point, *compare* the Smith-Corona with any other machine on the market today. You'll see why the Smith-Corona is not just equal...but *superior* to every other brand! Before you buy an electric typewriter, call your nearest Smith-Corona representative, and have him demonstrate the many exclusive features that make the Smith-Corona today's *soundest* typewriter investment!

Smith-Corona Electric

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in the design of portable machines. An electric portable has been introduced—although it is not fully electrified as it does have a manual carriage return. Another portable features the cartridge approach in changing ribbons. The ribbon is encased in two plastic containers similar to small film magazines and with the use of this, ribbons can be changed without being touched by hand. Some standard machines also have this feature.

Interchangeable type is now available for some models. With this feature the operator can very easily change the keyboard to permit her to print additional symbols and characters needed in specialized work.

Tabulation made easier

One of the very significant advances that have come about is concerned with tabulation. There is now a feature on some machines which allows a typewriter's tabulating mechanism to sense metallic ink printed on business forms. Forms used with this feature are printed with vertical lines of metallic ink at the left of each box on a fill-in form.

When the electronic sensing feature is used, tabulation is accomplished by pressing a special key. The carriage then moves until the metallic ink line is sensed by a special device and it stops just beyond the line. The typist at this point can make her entry without further tabulation or spacing.

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CLIFFORD F. HOOD

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"Those enrolled in the Payroll Savings Plan for U.S. Savings Bonds alone save the equivalent of one and one half $25 bonds a month.

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"The response of our employees to the Payroll Savings Plan for Savings Bonds is evidence of their faith in the nation. We are proud of their record in saving systematically in E Bonds, thus participating in a program of planned thrift while helping to build America's power to keep the peace."

CLIFFORD F. HOOD, ***President and Chairman, Executive Committee, United States Steel Corp.***

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OFFICE MANAGEMENT

The Magazine for Management Executives

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a code on paper tape carrying the same information appearing on the typed copy. This by-product coded information can be read in turn by other typewriters, by communications equipment, by tape-to-card punches and other types of business equipment.

Typewriter important to IDP systems

Because punched paper tape is one of the basic "common languages" for integrated data processing, the typewriter has become a fundamental instrument for introducing data into an integrated system.

Similar codes may be punched into the edge of a card, and some typewriters are capable of both punching and reading such cards. Some typewriters used in integrated data processing systems can encode material directly on magnetic tape that is used in electronic computers and still others can print out the results of data processing from computers and from measuring equipment used in manufacturing processes.

Thus the typewriter is still indispensable, even to the highly automated office which may use the most elaborate computer system, though historically it is one of the oldest office machines.

The Manufacturers

The list which follows covers the major manufacturers of office typewriters. The types of machines offered are indicated by the following codes:

A — Automatic typewriters, other than machines used in integrated data processing.

C — Composing and justifying machines.

IDP — Machines which read and/or produce a "common language" record or are otherwise suited for use in integrated data processing systems.

MI—Miscellaneous.

N—Noiseless machines.

NI — No information available at press time on current products.

PE—Portable electric machines.

PM—Portable manual machines.

SE—Standard electric machines.

SM—Standard manual machines.

SY—Systems machines.

Addo-X, Inc., 300 Park Ave., New York. (PM; SM)

R. C. Allen Business Machines, Inc., 678 Front Ave., N.W. Grand Rapids, Mich. (SE; SM)

Alma Office Machine Corp., 34 E. 30 St., New York 16. (PM; SM)

American Automatic Typewriter Co., 2323 N. Pulaski Rd., Chicago 39. (A)

American International Office Equipment Co., 7940 W. Third St., Los Angeles 48. (PM-NI; SE-NI; SM-NI)

American Voss Corp., 18097 Sorrento Ave., Detroit 35. (C-NI; PE-NI; PM-NI; SM-NI; SY-NI)

Cole Steel Equipment Co., Inc., 415 Madison Ave., New York 17. (PM)

DeJur-Amsco Corp., 45-01 Northern Blvd., Long Island City 1, N. Y. (MI-Electric carbon machine; PM; SE; SM)

Facit, Inc., 404 Fourth Ave., New York 16. (PM; SM)

Fremaco International, Inc., 188 W. Randolph St., Chicago 1. (PM; SM)

Friden, Inc., 2350 Washington Ave., San Leandro, Calif. (A-NI; C-NI; IDP-NI)

Inter-Continental Trading Corp., 90 West St., New York 6. (PM; SM)

International Business Machines Corp., 590 Madison Ave., New York 22. (IDP; SE)

Olivetti Corp. of America, 580 Fifth Ave., New York 36. (C; PM; SE; SM)

Paillard, Inc., 100 Sixth Ave., New York 13. (PM; SE; SM)

Remington Rand, Div. of Sperry Rand Corp., 315 Fourth Ave., New York 10. (A; C; IDP; N; PM; SE; SM)

Robotyper Corp., 125 Allen St., Hendersonville, N. C. (A)

Royal McBee Corp., Westchester Ave., Port Chester, N. Y. (A; IDP; PM; SE; SM)

Smith-Corona Marchant Inc., 701 E. Washington St., Syracuse 1, N. Y. (IDP; PE; PM; SE; SM)

Underwood Corp., 1 Park Ave., New York 16. (A-NI; IDP; PM; SE; SM)

Vari-Typer Corp., 720 Frelinghuysen Ave., Newark 5, N. J. (C-NI)

For a quick index to the "Tools of the Office" section see page 72

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Based on actual experience of America's best-run companies, Handbook uses hundreds of concrete examples showing how to boost profits through improved clerical cost controls, use of office electronics and automation, new salary administration procedures, advanced forms design and records control methods. From the entire literature of business and the findings of leading authorities, Handbook organizes vital office management developments which are today strengthening company performance in selling, purchasing, production, customer relations, and other important areas.

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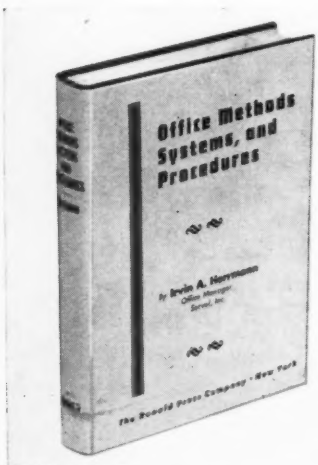
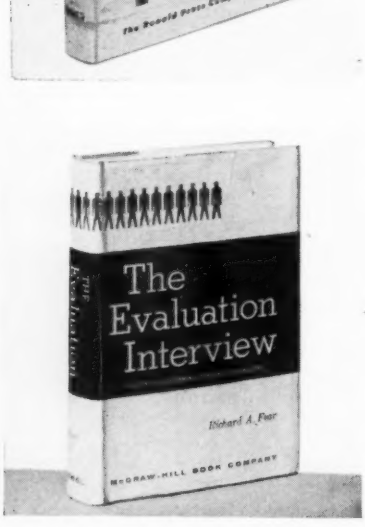
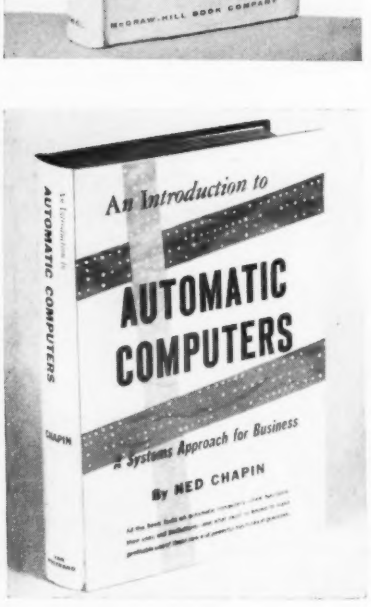
Books of interest to office administrators

Office executives are expected to have a wide range of knowledge in order to carry out their responsibilities—knowledge which cannot be gained from experience exclusively. Because they are complete and detailed, books are the logical means of supplementing the knowledge obtained from experience. The following list is intended to give the office administrator some indication of the books which may aid him in learning more about all major phases of his job.







Office Automation

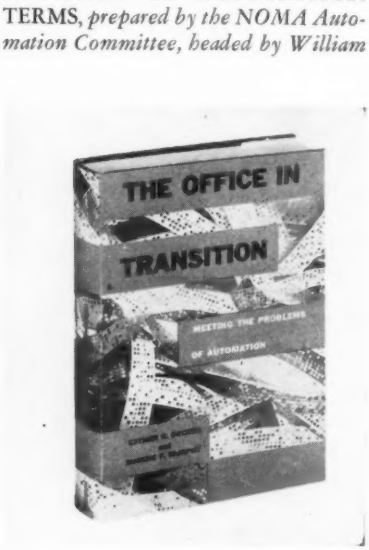
ADMINISTERING A CONVERSION TO ELECTRONIC ACCOUNTING: A CASE STUDY OF A LARGE OFFICE, *by Harold Farlow Craig. Div. of Research, Harvard Business School, Soldiers Field, Boston 63. $2.50.*

AUTOMATION AND MANAGEMENT, *by James R. Bright. Div. of Research, Harvard Business School, Soldiers Field, Boston 63. $10.*

COMPANY INVESTIGATIONS OF AUTOMATIC DATA PROCESSING, *by Peter B. Laubach. Div. of Research, Harvard Business School, Soldiers Field, Boston 63. $3.*

ELECTRONIC COMPUTERS AND MANAGEMENT CONTROL, *by George Kozmetsky and Paul Kircher. 296 pages. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36. $5.*

GLOSSARY OF AUTOMATION TERMS, *prepared by the NOMA Automation Committee, headed by William J. Jacquette, Ernst & Ernst, under the direction of Charles E. Ginder, staff director of NOMA Technical Div. 38 pages. National Office Management Association, 1931 Old York Rd., Willow Grove, Pa. $2.*



HANDBOOK OF AUTOMATION AND CONTROL, VOLUME I, *edited by Eugene M. Grabbe, Simon Ramo, and Dean E. Wooldridge. 1,020 pages. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16. $17.*

INSTALLING ELECTRONIC DATA PROCESSING SYSTEMS, *by Richard G. Canning. 193 pages. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16. $6.*

AN INTRODUCTION TO AUTOMATIC COMPUTERS, *by Ned Chapin. 544 pages. D. Van Nostrand Co., Inc., 120 Alexander St., Princeton, N. J. $8.75.*

A MANAGEMENT GUIDE TO ELECTRONIC COMPUTERS, *by William D. Bell. 391 pages. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36. $6.50.*

THE OFFICE IN TRANSITION, *by Esther R. Becker and Eugene F. Murphy. 190 pages. Harper & Bros., 49 E. 33rd St., New York 16. $3.50.*

PROCEEDINGS: AUTOMATIC DATA PROCESSING CONFERENCE, SEPTEMBER 8 AND 9, 1955, *edited by Robert N. Anthony. Div. of Research, Harvard Business School, Soldiers Field, Boston 63. $3.50.*

SUCCESSFUL OFFICE AUTOMATION, *by Ralph W. Fairbanks. 384 pages. Prentice-Hall, Inc., Englewood Cliffs, N. J. $10.*

Systems Design—and Development

ACCOUNTANTS' HANDBOOK, *by Rufus Wixon and Walter G. Kell. 1,616 pages. The Ronald Press Co., 15 E. 26th St., New York 10. $15.*

ACCOUNTING REPORTS FOR

MANAGEMENT, *by Ronello B. Lewis. 198 pages. Prentice-Hall, Inc., Englewood Cliffs, N. J. $15.*

COMMUNICATION IN MANAGEMENT, *by Charles E. Redfield. 314 pages. The University of Chicago Press, 5750 Ellis Ave., Chicago 37. $5.*

DEVELOPING EXECUTIVE SKILLS: NEW PATTERNS FOR MANAGEMENT GROWTH, *edited by Harwood F. Merrill and Elizabeth Marting. 432 pages. American Management Association, Inc., 1515 Broadway, New York 36. $9.*

THE EFFICIENT EXECUTIVE, *by Auren Uris. 320 pages. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36. $4.95.*

HOW TO FILE AN INDEX, *by Bertha M. Weeks. 306 pages. The Ronald Press Co., 15 E. 26th St., New York 10. $4.50.*

INTEGRATED COST CONTROL IN THE OFFICE, *by Frank M. Knox. 304 pages. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36. $7.50.*

MANAGEMENT ACCOUNTING FOR PROFIT CONTROL, *by I. Wayne Keller. 435 pages. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36. $7.*

MEN, MACHINES, AND THE MODERN OFFICE, *Management Report #6, American Management Association, Inc., 1515 Broadway, New York 36. $3.75.*

MOTIVATION RESEARCH AND MARKETING MANAGEMENT, *by Joseph W. Newman. Div. of Research, Harvard Business School, Soldiers Field, Boston 63. $7.50.*

OFFICE MANAGEMENT, *by Charles B. Hicks and Irene Place. 548 pages. Allyn & Bacon Inc., 150 Tremont St., Boston 11. $9.35.*

OFFICE MANAGEMENT HANDBOOK, *by Henry L. Wylie. 890 pages. The Ronald Press Co., 15 E. 26th St., New York 10. $12.*

OFFICE METHODS, SYSTEMS, AND PROCEDURES, *by Irvin A. Herrmann. 539 pages. The Ronald Press Co., 15 E. 26th St., New York 10. $8.50.*

Tools of the Office

ORGANIZING FOR EFFECTIVE SYSTEMS PLANNING AND CONTROL, *edited by Elizabeth Marting and Arnold Dolin. American Management Association, Inc., 1515 Broadway, New York 36. $4.50.*

PRACTICAL OFFICE TIME SAVERS, VOLUME II, *National Office Management Association. 305 pages. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36. $5.*

PRINCIPLES OF MANAGEMENT, *by H. D. Koontz and C. J. O'Donnell. 664 pages. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36. $6.50.*

SCIENTIFIC PROGRAMMING IN BUSINESS AND INDUSTRY, *by Andrew Vazsonyi. 474 pages. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16. $13.50.*

STREAMLINING BUSINESS PROCEDURES, *by Richard F. Neuschel. 324 pages. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36. $6.50.*

SUCCESSFUL LEADERSHIP IN BUSINESS, *by Charles A. Cerami. 224 pages. Prentice-Hall, Inc., Englewood Cliffs, N. J. $4.95.*

Personnel Problems and Practices

THE APPRAISAL INTERVIEW, *by Norman R. F. Maier. 246 pages. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16. $5.98.*

BEHAVIOR OF INDUSTRIAL WORK GROUPS: PREDICTION AND CONTROL, *by Leonard R. Sayles. 182 pages. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16. $4.75.*

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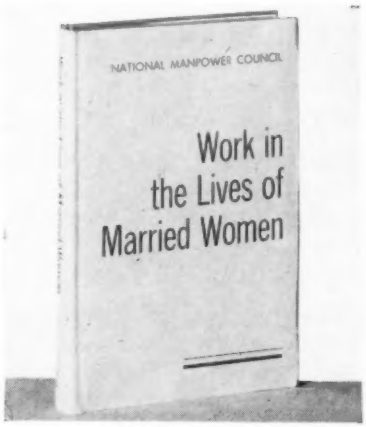
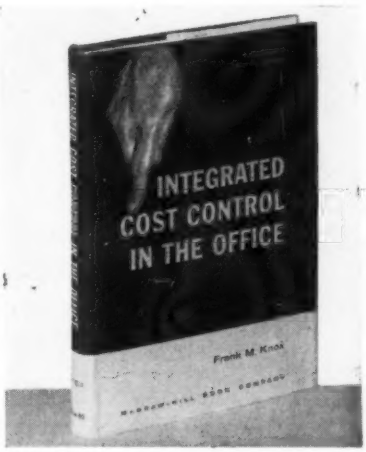
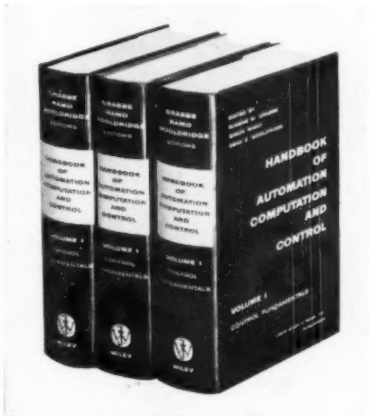
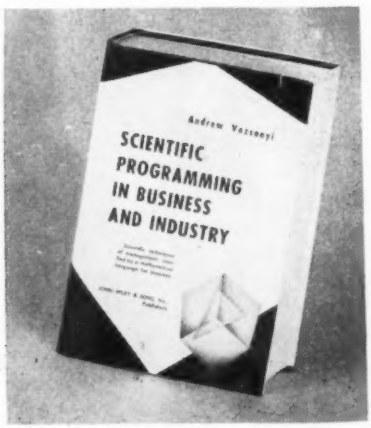








Richard A. Fear. 288 pages. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36. $6.

HOW TO SUPERVISE PEOPLE, *by Alfred M. Cooper. 264 pages. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36. $4.95.*

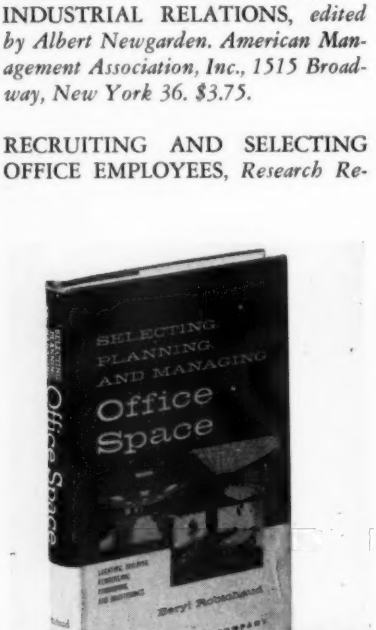
THE MOTIVATION, PRODUCTIVITY, AND SATISFACTION OF WORKERS: A PREDICTION STUDY, *by A. Zaleznik, C. R. Christensen, and F. J. Roethlisberger. Div. of Research, Harvard Business School, Soldiers Field, Boston 63.*

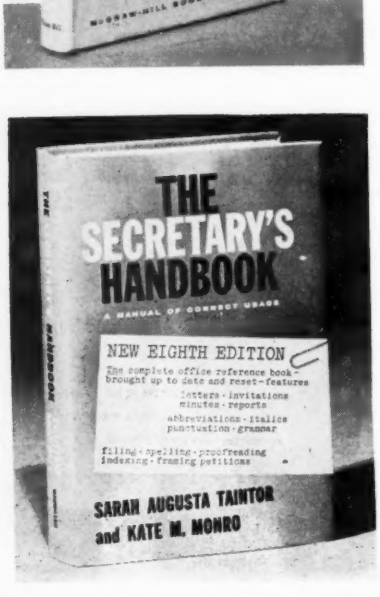
PROBLEMS AND PRACTICES IN INDUSTRIAL RELATIONS, *edited by Albert Newgarden. American Management Association, Inc., 1515 Broadway, New York 36. $3.75.*

RECRUITING AND SELECTING OFFICE EMPLOYEES, *Research Report #27. 175 pages. American Management Association, Inc., 1515 Broadway, New York 36. $4.75.*

THE SCANLON PLAN, *edited by Frederick G. Lesieur. 173 pages. The Technology Press, Cambridge, Mass., and John Wiley & Sons, 440 Fourth Ave., New York 16. $4.50.*

WORK IN THE LIVES OF MARRIED WOMEN, *National Manpower Council, Proceedings of a Conference on Manpower. 200 pages. Columbia University Press, Columbia University, New York 27. $4.75.*




THE SECRETARY'S HANDBOOK
A MANUAL OF CORRECT USAGE
NEW EIGHTH EDITION
The complete office reference book brought up to date and reset-features
letters · invitations
minutes · reports
abbreviations · italics
punctuation · grammar
filing · spelling · proofreading
indexing · framing petitions
SARAH AUGUSTA TAINTOR
and KATE M. MONRO

Tools of the Office

Miscellaneous

ACCOUNTING FOR NON-ACCOUNTANTS, *by John N. Myer. 227 pages. American Education Council, 2 E. Ave., Larchmont, N. Y., and New York University Press, New York. $5.*

CREATIVE THINKING, *by Charles S. Whiting. 168 pages. Reinhold Publishing Corp., 430 Park Ave., New York 22. $3.95.*

THE DIRECTOR LOOKS AT HIS JOB, *edited by Courtney C. Brown and E. Everett Smith. 150 pages. Columbia University Press, Columbia University, New York 27. $2.75.*

MATHEMATICS IN BUSINESS, *by Lloyd L. Lowenstein. 364 pages. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16. $4.95.*

SALE-LEASEBACKS AND LEASING IN REAL ESTATE AND EQUIPMENT TRANSACTIONS, *by Harvey Greenfield and Frank K. Griesinger. 175 pages. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36. $15.*

THE SECRETARY'S BOOK, *by S. J. Wanous and L. W. Erickson. 597 pages. The Ronald Press Co., 15 E. 26th St., New York 10. $4.25.*

For a quick index to the "Tools of the Office" section see page 72

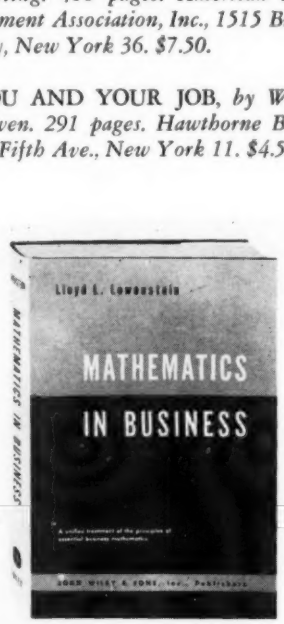
THE SECRETARY'S HANDBOOK, *by Sarah A. Taintor and Kate M. Monro. 559 pages. The Macmillan Co., 60 Fifth Ave., New York 11. $4.95.*

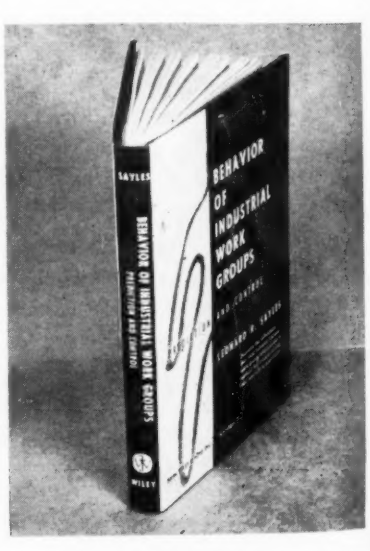
SELECTING, PLANNING AND MANAGING OFFICE SPACE, *by Beryl Robichaud. 361 pages. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36. $8.50.*

TARGETING SALES EFFORTS, *by Charles W. Smith. 396 pages. Columbia University Press, Columbia University, New York 27. $15.*

UNDERSTANDING COLLECTIVE BARGAINING, *edited by Elizabeth Marting. 416 pages. American Management Association, Inc., 1515 Broadway, New York 36. $7.50.*

YOU AND YOUR JOB, *by Walter Lowen. 291 pages. Hawthorne Books, 70 Fifth Ave., New York 11. $4.50.*





Manufacturers' list—

(From page 69)

James Lees & Sons Co., Bridgeport, Pa. (CA; CC; CN; CR; CW; MI-Wool-nylon blends)

The Magee Carpet Co., 295 Fifth Ave., New York 16. (C; CA; CC; DN; DR; CW)

Mastic Tile Corp. of America. P.O. Box 1151, Newburgh, N. Y. (T; TA; TR; TV; TVA)

Minnesota Mining & Mfg. Co., 900 Bush St., St. Paul 6, Minn. (MI-Resilient floor covering)

Mohawk Carpet Mills, Inc., Amsterdam, N. Y. (C-Viscose rayon; C-Dynel; C-special compositons; CW; MI-carpet cushioning)

National Tile & Mfg. Co., Anderson, Ind. (T-Ceramic)

The R. C. A. Rubber Co., 1833 E. Market St., Akron, Ohio. (MI-Vinyl and rubber roll goods; TR; TV)

Raybestos-Manhattan, Inc., Manhattan Rubber Div., Drawer No. 419, Passaic, N. J. (MR)

Robbins Floor Products, Inc., Tuscumbia, Ala. (TC: TR; TV)

Alexander Smith, Inc., 295 Fifth Ave., New York 16. (C-Synthetic yarns; CW)

Sorkin Enterprises, 11 Broadway, New York 4. (C-Vinyl)

Tab Products Co., 995 Market St., San Francisco 3. (MR)

Uvalde Rock Asphalt Co., Azrock Floor Products Div., P.O. Box 531, San Antonio, Tex. (T-vinylized; T-industrial vinyl; TA; TVA)

Weber Showcase & Fixture Co., Inc., Box 11065, Kearney Station, Los Angeles 11. (MI-Computer flooring for use with EDP machinery)

Lighting Fixtures

The following list includes the principal manufacturers of lighting fixtures for use in offices. The codes used to indicate the types of products offered are as follows:

DL—Desk lamps.

FL—Fluorescent luminaires, troffers, etc.

IF—Incandescent light fixtures.

LCE—"Luminous ceilings"—egg-crate and similar types.

LCT—"Luminous ceilings"—translucent types.

NI—No information on current products available at press time.

SS—Suspension systems supporting light fixtures incorporated in suspended ceilings.

Acme Light Products Co., Congers, N. Y. (DL)

Amplex Corp., 214 Glen Cove Rd., Carle Place, L. I., N. Y. (FL; IF)

Benjamin Electric Mfg. Co., Northwest Highway, Des Plaines, Ill. (FL; IF; LCE; LCT)

The Celotex Corp., 120 S. La Salle St., Chicago 3. (LCT)

Corning Glass Works, Corning, N. Y. (FL; IF; MI-Glassware for lighting fixtures)

Cupples Products Corp., 2650 S. Hanley Rd., St. Louis 17. (SS-NI)

Curtis Lighting, Inc., 6135 W. 65 St., Chicago 38. (FL-NI; IF-NI; LCT-NI)

Day-Brite Lighting, Inc., 6260 N. Broadway, St. Louis 15. (FL)

Dazor Mfg. Corp., 4481-87 Duncan Ave., St. Louis. (DL)

The Electron Corp., P.O. Box 208, Littleton, Colo. (FL)

Faries Lamp Div., General Lamp Mfg. Corp., 450 N. 9th St., Elwood, Ind. (DL)

Gruber Lighting, 125 S. First St., Brooklyn 11, N. Y. (FL-NI)

Edwin F. Guth Co., 2615 Washington Blvd., St. Louis 3. (FL; IF; LCE; LCT)

Holdenline Co., 2301 Scranton Rd., Cleveland 13, Ohio. (FL-NI; IF-NI)

Holophane Co., Inc., 342 Madison Ave., New York 17. (FL; IF)

Lam Workshop, Inc., 404 Main St., Wakefield, Mass. (FL-NI; IF-NI; LCT-NI)

Lighting Products, Inc., P.O. Box 338, Highland Park, Ill. (FL-NI; LCE-NI; LCT-NI)

Lightolier, Inc., 346 Claremont Ave., Jersey City 5, N. J. (FL-NI; IF-NI)

Luminous Ceilings, Inc., 2500 W. North Ave., Chicago 47. (LCE; LCT)

Lustre Corp. of America, 32-33 47 Ave., Long Island City, N. Y. (FL)

Luxo Lamp Corp., 102 Columbus Ave., Tuckahoe, N. Y. (DL)

The Miller Co., 99 Center St., Meriden, Conn. (FL)

Pittsburgh Reflector Co., Oliver Bldg., Mellon Square, Pittsburgh 22. (FL-NI; IF-NI; LCE-NI; LCT-NI)

Ruby-Philite Corp., 32-02 Queens Blvd., Long Island City 1, N. Y. (FL; IF; LCE; LCT)

Sunbeam Lighting Co., 777 E. 14 Place, Los Angeles 21. (FL; IF)

Swing-O-Lite, Inc., 13 Moonachie Rd., Hackensack, N. J. (FL)

Sylvania Electric Products Inc., Sylvania Lighting Products Div., 1 88 St., Wheeling, W. Va., (FL; LCT)

The Wakefield Co., 731 S. Water St., Vermilion, Ohio. (FL; IF; LCE; LCT)

Westinghouse Electric Corp., Lighting Div., 1216 W. 58 St., Cleveland. (FL-NI; IF-NI)

M. G. Wheeler Co., Inc., Sight Light Sales Div., Greenwich, Conn. (DL)

Movable Office Partitions

Following is a list of the major manufacturers of movable partitions, folding walls, and similar equipment.

The codes used to indicate the types of products offered are as follows:

FW—Folding walls and doors.

MI—Miscellaneous.

NI—No information available at press time on current products.

PF—Partitions for attachment to furniture.

PS—Partitions of the free-standing type.

Acme Steel Partition Co., Inc., 513 Porter Ave., Brooklyn, N. Y. (PS-NI)

Aetna Steel Products Corp., Arnot-Jamestown Div., 730 Fifth Ave., New York 19. (PS) (To page 162)

Unions—

(From page 35)

the top echelons of AFL-CIO or any other big union group. The two principal unions currently active in the white collar field have a reported total of 260,000 members. They are the American Federation of State, County & Municipal Employees (founded in 1936 and now claiming 200,000 members), and the Office Employes International Union (founded in 1945 and now reporting a membership of 60,000). Both are AFL-CIO affiliates. Both claim a steady growth of membership strength.

Still, that strength seemed rather feeble when, in February, 1957, the AFL-CIO Executive Council suddenly came alive to the office union question.

In a meeting at Miami Beach, the council okayed a scheme to bring no less than 13,000,000 unorganized white collar workers into union ranks! The plan called for 120 organizers who

would work with some twenty international unions to "crack" the office field.

A. H. Raskin, writing in *The New York Times* for February 7, 1957, reported:

"George Meany, the federation's president, expressed confidence that the drive would not be held back by jurisdictional conflicts. Such fights between unions over which group should get any workers who might be organized have blocked recruiting plans among industrial workers in the fourteen months since the labor merger. . . .

"Labor's plan for an organizing drive was warmly received by John W. Livingston, director of organization for the combined union. He said the results of isolated attempts to sign up white-collar employes in various areas had convinced him there was 'greater receptivity to unionization' among such workers now than ever before.

"However, there was little outward indication that the council members shared his optimism that any substantial increase in the present estimated total of 3,000,000 union white collar workers would be recorded in the near future."

By April 7, 1957, Joseph A. Loftus was writing in the *Times*:

"A few months ago the AFL-CIO undertook an ambitious campaign to organize 'white-collar' workers—teachers, office workers, and so forth. Mr. [John W.] Livingston had expected to hire forty new organizers—young people familiar with the 'white collar' problem. None has been hired and the prospect now is that none will be.

"A few representation elections among 'white collar' workers have been held and won, but the collapse of plans for additional organizers—for policy or financial reasons beyond Mr. Livingston's control—plus the climate created by the [Teamsters Union] hearing, have put the organizing campaign behind schedule."

If, between that time and now, the greater part of any new efforts has amounted to still more talk, it is the kind of talk that may finally get the drive for big white collar unions under way.

One indication of a new seriousness in the union approach, and a compelling reason for a real effort to organize the office, came last year, with a warning to labor by Everett M. Kassalow, AFL-CIO research director.

"The great over-riding problem," Mr. Kassalow has said, "is that of union organization of the white-collar and professional workers. In case anyone thinks this job of organization will take care of itself, let me remind you that the last great civil war in the American labor movement occurred because the movement itself was unable to adapt its structure sufficiently to meet the challenge of organizing new types of workers—namely the industrial workers in the great mass-production industries. . . .

Smaller units foreseen

"While it is hard to lay down rigid rules, if I were a president of an industrial union I would establish it as a general practice that all future additions to the organizing staff should come from the white-collar professional and technical ranks. I am exaggerating a bit here, of course, but the general point holds. Unless we make such a bold step we simply won't have the personnel to do the job in the next decade."

In the speech from which these excerpts come, and in other recent talks, Mr. Kassalow has made these additional points:

1. Technological change means smaller bargaining units; it makes the job of organizing industrial unions more difficult. "The very change in size, the trend towards smaller plants, complicates the task of organization. The sense of mass which characterized a River Rouge or an Akron Goodyear is no longer operating. The sheer physical necessity to counter the huge factory image of a River Rouge with a powerful workers' organization is not so immediately evident to workers in the smaller, new plants. . . . Not only is it harder to organize smaller units but the task of servicing them becomes more complicated."

2. As the nature of work changes, the union's role and organization must change with it. "This shift from manual to mental tasks will inevitably lead to changes in workers' interests, needs and capabilities. In many situations retraining will be necessary and we have not even begun to define the role of the union in this area. More generally I think that as a result of the shift in the nature of work many workers caught up in this new job environment may begin to take more of an interest in the production process as a whole. Who will reach out to meet these new interests of workers? Will it be management or the union?

3. In reorganizing, and to offset the effects of smaller bargaining units, the white collar worker must be included, in a major way, in the labor movement. "Right now we ought to be finding ways and means of giving white collar technical and professional workers more direct representation on the bargaining committees in big industrial plants. . . . It may be necessary to organize special divisions or conferences within the big industrial unions so as to provide the white-collar workers with effective representation on policy matters at the international level. I think we have a good deal to learn from our European brother unions so far as this question is concerned. . . . Offhand, however, I do not think that in the United States it will be possible to choose the road of building separate professional and technical unions for many of these workers [as in Europe]. Economic power in America to a considerable extent, flows along corporate and industrial lines. If white-collar professional and technical workers are to be effectively organized, they must somehow be grouped together in the great institution which industrial workers have already established to offset the great centers of corporate power—namely the powerful industrial unions in the steel, auto, rubber, oil, textile and other fields. . . . Of course we shall also face the task of strengthening the white-collar and professional unions [which] will represent these groups of workers who are employed outside of the basic industries and large corporations."

There are union officials, particularly in white collar unions which have been around for some time, who cannot agree with Mr. Kassalow's idea of grouping all types of workers together in the big industries or companies.

As a case in point, they cite Walter Reuther's handling of negotiations for white collar people at Chrysler. They charge that he didn't win enough for them, that as an industrial unionist he was inclined to use the office as a convenient place for compromise.

Officials of unions like Office Employes International say that, after all, they know the white collar field best. The arguments they use in a unioniz-

ing drive are the kind that management will undoubtedly hear over and over as the pressure for membership intensifies.

Here are some of these arguments, as outlined recently by OEIU's Director of Organization, H. B. Douglas:

Benefits for management. Yes, Mr. Douglas says, there are some. In many firms of from 50 to 60 people, salary patterns have grown in helterskelter fashion. People ask for raises or other considerations whenever they feel like it. Maybe they get what they want; maybe they don't. With a union, management negotiates once for everybody. Union members vote on the contract. "Morale jumps 100 percent."

Job security. Automation can mean not only more office workers, it can also mean newer workers replacing older ones. OEIU "tries to protect present personnel" when vast changes occur in office organization. It would "resist the resort to ready-made-crews, frequently recruited and provided by the companies that install automation systems, if this would mean dismissal of people now employed."

Promotions. In a typical case, says Mr. Douglas, the oldest employee has the opportunity for, but not the right to, advancement as positions open up. Job standards are negotiated between management and labor, but management may reach over the head of the fellow with highest seniority, and select a younger man whom it deems more qualified.

Grievances. "Again, take the case of an old employee who has been sidestepped. The union contract provides a formal procedure by which his grievance can be settled. He files his case with the shop steward who takes it up with the supervisor," Mr. Douglas explains. "Usually the matter stops right there. In an unorganized office, a guy with a grievance just stews. Here, though, the employee feels he has a way out. And this procedure can protect management from filling the post with a dud." The OEIU official cited the recent case of an organization that skipped over thirteen men with seniority to pick someone favored by a certain executive. The union hoped to show, in a grievance session, that not only had this been unfair to the thirteen bypassed people, but that, from management's viewpoint, the man proposed for the job was not the best one for it.

Union ethics. "In order to have a crooked union official," Mr. Douglas tersely asserts, "you have to have a crooked management official somewhere, too."

Strikes. In its fourteen-year history, OEIU has called an average of 20 strikes a year. But its organization director, like most labor men, says the aim is to prevent such last-ditch action through discusion, negotiation, and settlement.

Dues. By its charter, OEIU has fixed member dues at between $2 and $5 a month.

This review of white collar labor groups, their problems and potentialities, has presented the matter mainly as a *union* question. It has not attempted to explore the sensitive areas *between* unions and management to any great extent. In offices, this is still a small area, an area important mostly in what its future holds.

In summary, then, unions must first straighten out among themselves precisely how they intend to organize the office worker. Only then will management directly face this powerful force —as a powerful force—at the other end of the bargaining table. In the meantime, of course, management will feel the indirect influence of that power, if only as a *potential* limit to its freedom.

In the meantime, in other words, management can prepare.

With office work taking on some characteristics of production work; with women (the "until problem") returning at middle age to work, and in many cases intending to stay at work for the rest of their active lives; with men *and* women more conscious of pension rights and other security benefits; with swift social changes disturbing, perhaps frightening people, seeming to threaten their dignity as individuals—with all these things, and with labor's urgent need to maintain its strength virtually forcing it to organize the office, the stage is set for that act to emerge now from the wings.

Unless the unions completely garble their lines, and unless management can put on such a good show that no one buys a ticket to the union theater, chances are good that those unionized —and therefore strike-armed— offices described a bit fictionally at the beginning of this article, may become all too factual in the years ahead.

Automation—

(*From page* 16)

and aid to management decision making—are, while real enough, difficult to assign a definite dollar value.

But the recession forced many companies into the equivalent of a rough systems revision before they were even seriously considering electronic data processing. So to a degree they have already reaped some of the savings benefits—the most easily definable savings—achieved by a company that has taken major steps toward automation. The tendency among managers in this group, which used the recession as a time to tighten cost control throughout all company echelons, and eliminate deadwood in terms of people, processes, and procedures, may very well be to believe that they are enjoying the most tangible financial benefits of "automation" without having invested heavy sums in hardware. Moreover, it would seem a safe assumption that many such managers feel the most important preliminary steps toward automation, the simplification and systematization of the paperwork flow, have already been completed. If the business picture in the near future justifies the company going in for major capital expenditure, presumably electronic hardware can be installed without the long preliminary studies and revisions that have been necessary in companies which only revised their systems in anticipation of a computer installation. After all, the argument would run, we already have revised our system so that it is efficient. We've found our weak spots and eliminated them.

The first and most obvious hole in such an argument is that because some weak spots, which would never have been allowed to develop if management had been exercising tight control during the past ten years, have been eliminated, and some procedures have been tightened, it does not follow that a given company's systems picture has been improved to the point where converting to electronic data processing will be in any way an easy chore. It is far more likely that a workable system depending on conventional equipment has merely been overhauled and put into better running order. That is a different matter entirely from devising a system which will serve as a firm foundation for centralized data proc-

essing facilities. It is the difference between a repair and restoration job on the one hand, and creation of an entirely new model on the other.

But the feeling that the immediate benefits of reduced costs have been won, and that equipment investment can be put off for a while without doing any harm, illusory as it may be in terms of a true understanding of the distinction between overall systems revision and patchwork systems repair, and a true conception of the importance of the intangible benefits that may be gained from electronic data processing, is apt to be appealing to management when it has had a scare, and is still chary about too a great confidence for the future.

And that this is a fair description of the state of mind of management in most American companies is indicated by a *Business Week* survey which appeared last month (*Business Week,* December 6, 1958, page 17). Gist of the report: Most businessmen expect 1959 to be a better year than 1958, but few expect it to set any spectacular records. Comment from a Texas concern is typical: "We think 1959 will be a lot better than 1958, but we don't think the time has come to spend any money anticipating it." The general attitude is that companies will invest capital if they can foresee a quick return on their money. Otherwise—they'll wait and see how things go.

That this trend may be even more widespread than most businessmen will admit in their present statements is illustrated by a recent article in *The New York Times* magazine ("Lessons of the Recession," Edwin L. Dale, Jr., *New York Times* magazine, October 5, 1958).

"Another lesson is that one of the new factors in the economy that was supposed to make us more slump-proof clearly is not as potent as some economists had thought it.

"The new factor, so the theory went, was that modern businessmen schedule their investment in plant and equipment on a long term basis, rather than change their plans with the first sign of economic squalls. Perhaps some of them do. But enough do not, as evidenced in this recession, to make business investment almost as volatile a part of the economy as ever.

"The evidence comes from a comparison of reported investment plans, as surveyed by the government, and actual spending. Total investment spending in the first and second quarter of 1958 was, at annual rates, a whopping $5 billion below the originally reported intentions last fall and winter."

Of course, this tendency to switch directions quickly as conditions change, rather than follow a long term plan faithfully, could cut two ways. If the tempo of the recovery accelerates, if there are signs of another boom developing rapidly, business may abandon its present caution. In the 1958 *Office Management* Yearbook, the magazine, reporting on the slowdown in office automation, attributed it to poor business conditions and a wave of reaction against blind acceptance of "automation"—which many companies translated as electronic data processors.

It predicted that the greatest impetus to renewed interest in computers—or at least heavy clerical mechanization short of the computer level—among companies at all levels would stem either from a renewal of the boom, or paradoxically, a continuation and worsening of the recession.

Neither condition exists

In the first instance, the article pointed out, companies really convinced that they could benefit from heavy mechanization, would, looking toward the future, recognize the advantages they could gain over their competition though mechanization at the points where it would be appropriate in the clerical processing lines, even if they did not go in for centralized electronic data processing facilities. Furthermore, during a boom their profit picture would be good enough to convince them that the investment in equipment would be justified.

On the other hand, the article continued, if the recession worsened, progressive managements would begin to feel they would be better off mechanizing, even if it required heavy initial capital outlays, as a means of eventually cutting their clerical personnel requirements, and thus achieving lower operating expenses.

Neither one of those two postulated conditions has materialized. While there are definite signs of a substantial business recovery, few would be optimistic enough to label the present state of affairs a boom. And so, the attitude of business toward the first level of automation—heavy mechanization, which may or may not involve a computer—remains equivocal. Few companies have even attempted second level automation—the control of company processes, and certain levels of decision making by the electronic data processing facilities—without first insuring that the major routine clerical data processing responsibilities susceptible to electronic processing had been converted to mechanization.

But two developments promise to accelerate the pace of automation during the year ahead. To the degree, of course, that business retains its present upward curve, management will become more confident about major investments, even if it does not take quite the cavalier attitude that was too common a few years ago. While management may be hesitant about investment in major electronic installations, a continuing rise in profits will eventually bring increased emphasis on mechanization at the points in the processing system where machines can perform the work faster, more, economically, and more accurately than human beings. Human beings will remain in control of the machines, but a great deal of the basic computing and routine processing will, under human direction, be carried forward automatically.

This has been defined by this magazine as the first level of automation—and it is the level that is far more appropriate for many companies than anything more elaborate. For instance, as was pointed out in an article in *Office Management* in June, 1958, mechanization at points in the clerical processing sequence can be profitable for even very small companies or offices, as long as the number of items to be handled is large enough. The article cited the case of a small charitable organization in San Francisco which found it both economical and efficient to employ an IBM Cardatype—a fairly sophisticated machine, capable of doing much more complex tasks than were required of it in this instance—to process solicitations to former contributors when they did not contribute to current appeals. The machine, even though operating at far less

(*To Page* 164)

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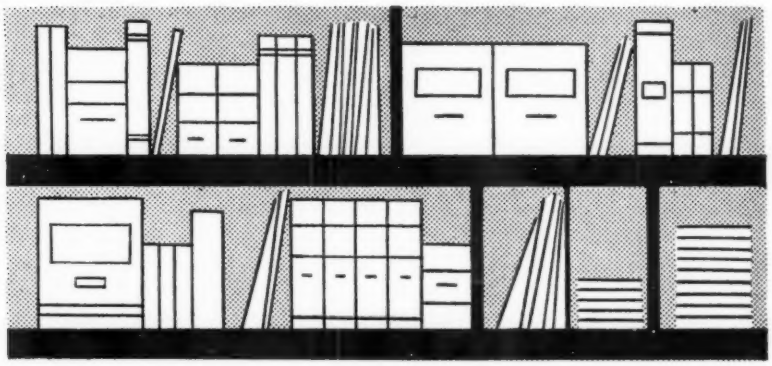
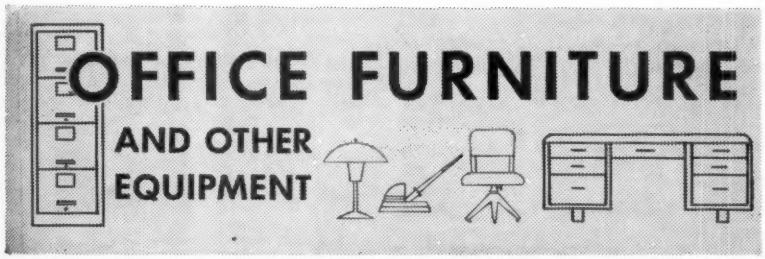
CATALOGS

BOOKLETS, BROCHURES FOR THE OFFICE





A. & F. Fileboard Co., Inc., P.O. Box 4085, Alexandria, La. Literature on AFCO Roll-Ezy chair mats. **(1)**

Abbeon Supply Co., 179-15 Jamaica Ave., Jamaica 32, N. Y. Bulletin No. 512 contains information on dehumidifiers for industrial and home use. **(2)**

Acme Lite Products Co., Route 9W, Congers, N. Y. Literature on fluorescent, portable desk lamps. **(3)**

Arnot Furniture Div., Aetna Steel Products Corp., 730 Fifth Ave., New York 19. Literature on modular furniture, including the new Decor Series. **(4)**

Alan Wood Steel Co., Penco Div., Oaks, Pa. Catalog, *Penco Book Case Shelving*, describes bookcase units showing sizes and types. **(5)**

All-Steel Equipment, Inc., Aurora, Ill. Illustrated catalogs on the following office furniture: chairs, desks, files and storage cabinets. **(6)**

R. C. Allen Business Machines, Inc., 678 Front St. N.W., Grand Rapids, Mich. Literature on the complete line of "A.B.C." label safes and insulated filing equipment. **(7)**

Art Metal Construction Co., Jamestown 13, N. Y. *Modulars*, a 32-page guide to modular equipment and its uses. **(8)**

Atlas Stencil Files Corp., 16716 Westfield Ave., Cleveland 10. Literature on vertical filing systems for blueprints, negatives, offset plates and stencils. **(9)**

Automatic Electric Sales Corp., Northlake, Ill. Circular No. 1753-B, *How to Get Communications Efficiency with P-A-X Business Telephone Systems*. **(10)**

Bentson Manufacturing Co., 652 N. Highland Ave., Aurora, Ill. Brochure, *Door to Office Comfort*, describes complete steel desk and file line. **(11)**

Boling Chair Co., Siler City, N. C. Catalog showing complete line of upholstered and all-wood office chairs and sofas. **(12)**

The Brewer-Titchner Corp., Furniture and Equipment Div., Cortland, N. Y. Catalog describing the BTC folding chair line. **(13)**

Browne-Morse Office Furniture Co., Muskegon, Mich. Catalog on the firm's desks, modular furniture, partitions, filing supplies, and a catalog on posture chairs. **(14)**

Irwin Casper Inc., 401 Broadway, New York 13. Information on the firm's office partitions and shelving. **(15)**

W. A. Charnstrom Co., 422 S. 7th St., Minneapolis 15. Charnstrom mailbag holder brochure describing two-bag and four-bag models. **(16)**

Clark & Gibby, Inc., 8 W. 40th St., New York 18. Brochure illustrating executive reception area furnishings. **(17)**

Cole Steel Equipment Co., Inc., 415 Madison Ave., New York 17. Chairs, counters, desks, filing cabinets, furniture, lamps, lockers, and modular units are illustrated in the "1959" catalog. **(18)**

Convoy, Inc., P.O. Box 216-0 Station "B," Canton 6, O. Folder on Rigid Convoy transfer files. **(19)**

Corry-Jamestown Corp., Corry, Pa. Brochure, *Discover New Correlation*, outlines design and color in "Correlation" steel office furniture. **(20)**

Cramer Posture Chair Co., Inc., 625 Adams St., Kansas City 5, Kansas. Two brochures, *The Pattern of Perfection in Executive Office Chairs*, and *Stepping up with Safety*, illustrating the office use of mobile step ladders. **(21)**

Currier Manufacturing Co., Inc., 2448 W. Larpenteur Ave., St. Paul 13, Minn. New ten-page folder showing fifty steel-made office equipment items. **(22)**

Cushman & Denison Manufacturing Co., Inc., 730 Garden St., Carlstadt, N. J. *Ke-Master Key Control System* lists units for key control of 10 keys or thousands. **(23)**

DeLuxe Metal Furniture Co., Struthers St., Warren, Pa. Literature on storage, wardrobe and combination cabinets, as well as open shelf filing equipment. **(24)**

Diebold, Inc., Canton 2, O. Advice on better record storage at lower cost is offered in *Diebold Steel Storage Files.* **(25)**

Dolin Metal Products, Inc., 315 Lexington Ave., Brooklyn 16, N. Y. Literature describes three styles of steel transfer files, as well as mobile storage and open shelf file units. **(26)**

Faultless Caster Corp., Evansville 7, Ind. Form No. 203, literature on wood and metal office chair casters, glides, and furniture cups. **(27)**

Foster Manufacturing Co., 13th and Cherry Sts., Philadelphia 7. Catalog gives an account of Many-Purpose Storage Cabinets and other filing equipment. **(28)**

Gates Acoustinet Co., 222 American Standard Bldg., Buffalo 7, N. Y. Literature on wood office machine enclosures designed to absorb "Noise at its Source." **(29)**

General Fireproofing Co., Youngstown 1, Ohio. *A New Concept of Executive Environment,* brochure describing the firm's new line of executive furniture. **(30)**

Exec-Units Div., General Plywood Corp., P.O. Box 1403, Louisville 1, Ky. Catalog shows sizes and details of space dividers and movable partitions. **(31)**

Edwin F. Guth Co., 2615 Washington Blvd., St. Louis. Condensed lighting fixture catalog includes fluorescent and incandescent luminaires for office lighting. **(32)**

Walter Haertel Co., 2840 Fourth Ave. South, Minneapolis 8. Literature on Adjusto Deck shelving and rack fittings. **(33)**

Hamilton Cosco Inc., 2525 State St., Columbus, Ind. Catalog on Cosco office furniture, including chairs and reception room furniture. **(34)**

Haskell, Inc., P.O. Box 5273, Pittsburgh 6. Catalog, *Budget Steel Office Furniture,* on credenzas, desks, drafting desks, files, and tables. **(35)**

Hillside Metal Products, Inc., 262-270 Passaic St., Newark 4, N. J. Catalog No. 757 on steel desks, files, tables and modular equipment. **(36)**

Indiana Cash Drawer Co., P.O. Box 236 Shelbyville, Ind. Literature on undercounter and top-of-counter cash drawers. **(37)**

Indiana Chair Co., P.O. Box 70, Jasper, Ind. Catalog on eight new walnut office and reception room chairs. **(38)**

Jayem Sales Corp., 31 Coffey St., Brooklyn 31, N. Y. Catalog deals with metal office accessories and space savers for office, shop, showroom and factory. **(39)**

Kisco Co., Inc., 2400-40 DeKalb St., St. Louis 4. Literature on "Circulair" floor model air circulators, and "Cool-Circle-Ator" Window fans. **(40)**

LeFebure Corp., 716 Oakland Rd. N.E., Cedar Rapids, Ia. Booklet describes mail handling and sorting unit called "Mail-Kwik." **(41)**

Lyon Metal Products, Inc., 24 Railroad Ave., Aurora, Ill. Steel equipment for office and factory is covered in No. 100 catalog of 84 pages. **(42)**

Mayfair Industries, Inc., 601 Madison Ave., New York 22, Catalog, *"Sixteen Pages of Comfort Seating Ideas,* illustrates suggested uses for folding chairs. **(43)**

Meilink Steel Safe Co., 1672 Oakwood Ave., Toledo 6, O. Brochures illustrating and describing "A," "B" and "C" label safes. **(44)**

Midwestern Manufacturing Co., Inc., 419-20 Lemcke Bldg., Indianapolis 4, Ind. Literature on insulated ledger, map and plan files. **(45)**

Modern Steelcraft, Inc., 2973 Cropsey Ave., Brooklyn 14, N. Y. Catalog on fire resistant security boxes. **(46)**

Momar Industries, 4323 W. 32nd St., Chicago 23. Literature on vertical filing equipment for blueprints, maps and large sheets. **(47)**

Monarch Furniture Co., Inc., 803 Ward St., High Point, N. C. Literature on upholstered furniture for office or institution. **(48)**

Monarch Metal Products, Inc., New Windsor, N. Y. Catalog No. 4 on data processing and auxiliary equipment. **(49)**

P. O. Moore, Inc., Glen Riddle, Pa. Literature on key control systems and key cabinets. **(50)**

The Mosler Safe Co., 320 Fifth Ave., New York 1. Information on the Revo-File and Roto-File, the rotary file said to bring a card to operator in 1½ seconds. **(51)**

Murphy-Miller, Inc., Box 516, Owensboro, Ky. Catalog No. 581, *Commercial and Institutional Chairs,* as well as catalogs on "custom planned" and "V.I.P." desks. **(52)**

National Furniture Manufacturing Co., Box 209, Evansville, Ind., Catalog of 40 pages on office reclining chairs in addition to information on sofas and sectionals. **(53)**

National Vulcanized Fibre Co., Box 311, Wilmington, Del. Descriptive literature on light-weight and Jumbo-size waste receptacles. **(54)**

Northwest Metal Products Co., 1337 E. Mason St., Green Bay, Wis. Catalog on Northwest "V" expanding files and desks. **(55)**

Office Equipment Manufacturing Co., Inc., 2208-10 Summer St., Dallas, Tex. Literature on Permafile corrugated transfer cases. **(56)**

Posting Equipment Corp., 1028 Niagara Ave., Buffalo, N. Y., Catalog No. 58, *Posting Equipment for Every Business Need.* **(57)**

Jens Risom Design, Inc., 49 E. 53rd St., New York 22. Top executive group brochure presenting custom styled desks. **(58)**

Rol-Away Truck Mfg. Co., Inc., 6143 S. E. Foster Rd., Portland 6, Ore. Catalog #104 illustrating over seventy specialized material handling trucks for every purpose. **(59)**

Royal Metal Manufacturing Co., 1 Park Ave., New York 16. Office and reception room furniture is presented in an 8-page folder. **(60)**

Sainberg and Co., Inc., 37 West 26 St., New York 10. Information on eight styles of leather open stock executive desk accessories. **(61)**

Security Steel Equipment Corp., Avenel, N. J. Literature on a series of "Modulaire" office furniture units. **(62)**

The Shaw-Walker Co., Muskegon, Mich. 252-page catalog describes 5000 office products including fireproof equipment, desks, files, chairs and counters. **(63)**

Spitzka Manufacturing Co., 235 Colfax St., North Sacramento, Calif. Literature on "Beverette" portable bar and beverage cabinet for the office. **(64)**

Standard Pressed Steel Co., Box 919, Jenkintown, Pa. *Office Chairs by Columbia* is an 8-page, color catalog dealing with chairs for the office. **(65)**

Sunbeam Lighting Co., 777 E. 14th Pl., Los Angeles 21. Brochures on engineered lighting fixtures for office illumination. **(66)**

Supreme Steel Equipment Corp., 53 St. and First Ave., Brooklyn, N. Y. Steel Cabinet Catalog (storage, wardrobe, bookcases, library shelving). **(67)**

Sylvania Lighting Products, 1 48th St., Wheeling, W. Va. Literature on recessed lighting fixtures. **(68)**

Tab Products Co., 995 Market St., San Francisco 3. Catalog No. 9 describes enclosed, shelf-type file cabinets which come in various sizes. **(69)**

The Taylor Chair Co., Bedford, O. Catalog on chairs for executive and professional offices, banks, public buildings and institutions. **(70)**

Tiffany Stand Co., Inc., 7350 Forsyth Blvd., St. Louis 5. Catalog tells of office machine stands, utility tables and portable book stands. **(71)**

Top Flight Products Co., 6224 S. Oakley Ave., Chicago 36. Literature on several available steel transfer cases. **(72)**

Visi-Shelf File, Inc., 225 Broadway, New York 7. Literature on open and closed-type shelf filing. **(73)**

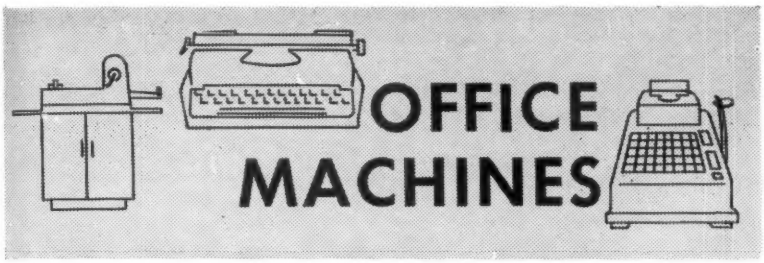
The Wadsworth Mfg. Co., P.O. Box 125, Wadsworth, Ohio. Literature on CADM gathering tables, and collating equipment. **(74)**

Wells Chair Corp., P.O. Box 230, Michigan City, Ind. Catalog, *Executive Seating on Foam Rubber*, describes line of steel, upholstered executive chairs. **(75)**

Wheeldex & Simpla Products, Inc., 1000 Division St., Peekskill, N. Y. *Mechanized Card Filing* gives information on automatic card finding equipment. **(76)**

Wright Line, Inc., 160 Gold Star Blvd., Worcester 6, Mass. Catalog gives an account of the Wright Rotary File. **(77)**

Yawman & Erbe Mfg. Co., Inc., 1099 Jay St., Rochester 3, N. Y. *Modern Steel Office Furniture* by "Y" and "E" is 48-page catalog showing newest trends in office furniture and arrangement. **(78)**



Addo-X, Inc., 300 Park Ave., New York 22. Folders on printing calculators and push-button multipliers. **(79)**

Address-A-Matic Addressing Machine Co., 1410 So. Harwood St., Dallas, Tex. Literature on the Address-A-Matic addressing machines and supplies, as well as electric stencil cutters **(80)**

Ajax Business Machines, Inc., 112 Magnolia Ave., Westbury, N. Y. Catalog on timing, dating and/or numbering machines. **(81)**

Alwac Computer Div., El-Tronics, Inc., 13040 S. Cerise Ave., Hawthorne, Calif. Equipment brochure describing digital computer system components for office automation. **(82)**

American Automatic Typewriter Co., 2323 N. Pulaski Rd., Chicago 39. *Letter Typing Automatically with Auto-typist* illustrates Auto-typist automatic typewriters. **(83)**

American Geloso Electronics, Inc., 312 Seventh Ave., New York 1. Eight-page illustrated brochure describing versatile uses of portable, true-fidelity recording and dictating machines in business management. **(84)**

American Numbering Machine Co., Atlantic & Shepherd Aves., Brooklyn 8, N. Y. Booklet, *Numberama*, gives an account of the complete line of American numbering and dating machines. **(85)**

Archer Label Co., 783 Kohler St., Los Angeles 21. Descriptive literature on manual and electric dispensers for contact pressure-sensitive labels. **(86)**

Bendix Computer Div., 5630 Arbor Vitae St., Los Angeles 45. Bendix G-15 Computer and accessories for data processing are explained in a 6-page brochure. **(87)**

Bohn Duplicator Corp., 444 Fourth Ave., New York 16. Literature on the BDC Contex, a ten-key calculator. **(88)**

Burroughs Corp., Detroit 32, Mich. *The whats, whys and wherefores*, a discussion of adding machines. **(89)**

Cheshire, Inc., 1644 N. Honore St., Chicago 22. Literature on Feeders to be attached to multigraph units and on Rotary labeling heads. **(90)**

The Cincinnati Time Recorder Co., 1733 Central Ave., Cincinnati 14, O. Literature on time recording and programming equipment. **(91)**

Clary Corp., 408 Junipero St., San Gabriel, Calif. Six-page brochure details how firm's electronic computer performs many functions of larger, more complicated units. **(92)**

Copease Corp., 425 Park Ave., New York 22. *The Truth About Office Copying Machines* gives advice on choosing the proper office copying machine. **(93)**

Copycat Corp., 215 Fourth Ave., New York 3. Literature on a new spray process photocopy machine. **(94)**

Cummington Corp., 718 Beacon St., Boston 15, Mass. *Smashing the Paper Barrier*, booklet on collating machines and methods. **(95)**

J. Curry Mendes Corp., Turnpike St., Canton, Mass. Literature is available on the Perf-Former, a machine which perforates, serially numbers, and adds marginal information in one operation. **(96)**

Davidson Corp., 29 Ryerson St., Brooklyn 5, N. Y. *Questions and Answers*, a 30 page booklet describing the unique two cylinder offset principle of Davidson Offset Duplicators. **(97)**

Dennison Mfg. Co., Machines Systems Div., Framingham, Mass. Booklet on Print Punch Marking Machine and uses of industrial tags imprinted and code-punched for automatic data processing control systems. **(98)**

Diebold, Inc., Flofilm Div., Box 127, Norwalk, Conn. Literature available on firm's Flofilm portable microfilm cameras and readers. **(99)**

Dukane Corp., St. Charles, Ill. Literature deals with internal communications systems, including intercoms and private automatic telephones. **(100)**

Eastman Kodak Co., 343 State St., Rochester 4, N. Y. *Four Versatile Office Time-savers* offers descriptions of the four Verifax office copiers. **(101)**

Thomas A. Edison Industries, Voicewriter Div., West Orange, N. J. Two booklets, *Edison Televoice*, the facts on network dictating systems employing the firm's lines and phones, and *Edison Dial Televoice*, the facts on network dictating systems employing interoffice dial telephones. **(102)**

Electrodata Div., Burroughs Corp., 460 Sierra Madre Villa, Pasadena, Calif. Literature on Burroughs E101, 205, and 220 electronic data processing machines. **(103)**

Executone, Inc., 415 Lexington Ave., New York 17. Literature on how the firm's intercom and sound systems save time and money in offices. **(104)**

Fanon Electric Co., Inc., 98 Berriman St., Brooklyn 8, N. Y. *Intercommunication for Industry* offers data on telephones, transistorized, and tube-type communications equipment. **(105)**

Felins Tying Machine Co., 3351 N. 35th St., Milwaukee 16, Wis. Literature on Felins Pak Tyer Tying Machine for tying packages, boxes, mail and printed matter. **(106)**

Wm. A. Force & Co., Inc., 216 Nichols Ave., Brooklyn 8, N. Y. 37-page "Selector" catalog showing firm's line of hand numbering machines and metal daters. **(107)**

Friden, Inc., San Leandro, Calif. *Tape-Talk Machines for Integrated Data Processing* describes punched paper tape uses. **(108)**

Gem Adding Machine Co., Cuba, N. Y. Literature dealing with automatic pocket adding machines. **(109)**

General Stationers Supply Co., 1020 S. Wabash Ave., Chicago 5. Catalog gives an account of Posto-E Electric Letter Opener. **(110)**

The Gray Mfg. Co., 16 Arbor St., Hartford 1, Conn. Booklet incorporating a demonstration-in-print of the firm's transistorized dictating instrument, the Key-Noter Audograph. **(111)**

Haloid Xerox Inc., 38-257 Haloid St., Rochester 3, N. Y. Booklet X-287 detailing advantages of XeroX Copyflo 24 continuous printer. **(111A)**

A. P. Heinz Co., 2422 Lunt Ave., Chicago 15. Literature on the Heinz Portable Collator, describing its use for gathering of paper. **(112)**

The Heyer Corp., 1850 S. Kostner Ave., Chicago 13, *Latest Machines and Supplies for all Duplicating Processes.* **(113)**

Kenro Graphics, Inc., 25 Commerce St., Chatham, N. J. Literature on Kenro "Vertical 18" Process Camera and accessory prismatic and xerographic heads. **(114)**

Lathem Time Recorder Co., 76 3rd St., N.W. Atlanta, Ga. *For Accurate Time Records* tells of the new 4,000 Series Lathem Time Recorder for 1959. **(115)**

Michael Lith, Inc. 145 W. 45th St. New York 36. Literature on "Triumph" and "Michael" paper cutters, office and duplicating department cutting machines. **(116)**

Marchant Calculators, 1475 Powell St., Oakland 8, Calif. Pamphlet, *Index to Modern Figuring by Marchant Methods*, a listing of methods of figurework in a wide variety of fields. **(117)**

Master Addresser Co., 6500 W. Lake St., Minneapolis 26. Catalog, *Spirit Duplicating and Addressing Machines.* **(118)**

Miles Reproducer Co., Inc., 812 Broadway, New York 3. Literature on self-powered, briefcase-type recorder and transcriber for office, car, or plane. **(119)**

Minneapolis-Honeywell Regulator Co., Datamatic Div., 151 Needham St., Newton, Mass. 16-page brochure describing all the units in the firm's Datamatic 1000 electronic data processing system. **(120)**

Monroe Calculating Machine Co., Inc., Orange, N. J. Booklet, *The Eternal Quest for Time*, tells of various calculating machines. **(121)**

The Multistamp Co., P.O. Box 1249, Norfolk 1, Va. Illustrated, descriptive catalog of Multistamp Stencil Duplicators for order handling and shipping. **(122)**

The National Cash Register Co., Dayton 9, Ohio. Literature on cash registers, accounting machines, adding machines, and electronic recording devices. **(123)**

North American Philips Co., Inc., Dictating Equipment Div., 230 Duffy Ave., Hicksville, L. I., N. Y. Brochure, *The Machine that Made Office Dictation and Transcribing 50% Simpler.* **(124)**

Office Dynamics Corp., 9876 Wilshire Blvd., Beverly Hills, Calif. Literature outlines specifications on the Automailer, an integrated mailing machine. **(125)**

Olson Radio Warehouse, Inc., 260 S. Forge St., Akron 8, Ohio. Catalog covering such items as miniature tape recorders, intercoms, extra speakers for Autocalls. **(126)**

Paragon-Revolute Corp., 77 South Ave., Rochester 4, N. Y. Literature on blueprinting and whiteprinting machines. **(127)**

Peerless Photo Products, Inc., Shoreham, N. Y. Pamphlet, *Office Copy Machines*, gives an account of various office copying processes. **(128)**

Peirce Dictation Systems, 5900 N. Northwest Hwy., Chicago 31. Brochure gives facts on available dictation systems. **(129)**

Philco Corp., Government and Industrial Div., 4700 Wissahickon Ave., Philadelphia 44. Brochure, *Philco Transac S-2000*, describes all-transistor, large-scale data processing system. **(130)**

Photostat Corp., 1001 Jefferson Rd., Rochester, N. Y. Brochure on Masterlith Offset Duplicator, illustrating product features, models, and accessories. **(131)**

E. W. Pike & Co., Inc., P.O. Box 4, 577 Pennsylvania Ave., Elizabeth, N. J. Literature on the Pike "Better Moistener" envelope and label moistener. **(132)**

W. H. Pusch, 427 W. Lynwood St., San Antonio, Tex. Circular describes the 78ER Computer and its use in installment-account problems. **(133)**

Remington Rand, Div. of Sperry Rand Corp., 315 Fourth Ave., New York 10. Eight-page folder on the components and values of the Univac File-Computer System, including a discussion of the random access feature. **(134)**

Rex-Rotary Distributing Corp., 387 Fourth Ave., New York 16. Catalog on duplicators, stencil cutter, addressing machines and supplies. **(135)**

Rotolite Sales Corp., Essex St., Stirling, N. J. Catalog, *Dry White Copies Right Now with Rotolite*, tells about a whiteprinter. **(136)**

Royal McBee Corp., Data Processing Div., Westchester Ave., Port Chester, N. Y. New punched card processing machine is treated in the brochure, *Keysort Tabulating Punch.* **(137)**

Scribe Distributors Co., 6949 W. North Ave., Oak Park, Ill. Literature on dictation-transcribing systems. **(138)**

The SoundScriber Corp., Box 1941, New Haven, Conn. Literature on Soundscriber's portable battery dictating machines. **(138A)**

Stromberg-Carlson, Div. of General Dynamics Corp., 1400 N. Goodman St., Rochester 3, N. Y. Catalog, *Why Key-Municator Belongs on your Desk*, outlines new concept in loudspeaking intercommunication. **(139)**

Systematics Inc., 60 E. 42 St., New York 17. Information on the firm's NCR Accounting Machine, IBM 632, and its new C-749 for tape to card conversion. **(140)**

Talk-A-Phone Co., 1512 S. Pulaski Rd., Chicago 23. Literature on intercommunication equipment for industry, home and office. **(141)**

Tecnifax Corp., 195 Appleton St., Holyoke, Mass. Literature on Tecnifax diazotype reproduction equipment and materials. **(142)**

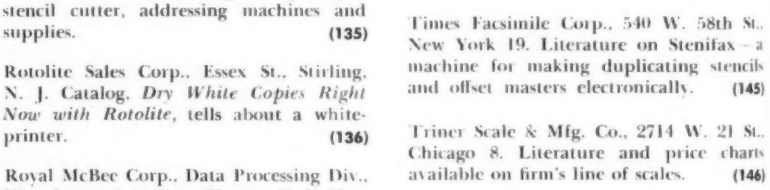
Teletype Corp., Dept. OM4-6531, 4100 Fullerton Ave., Chicago 39. Literature on the firm's new Model 28 communications and tape punching and reading equipment. **(143)**

Thomas Collators, Inc., 50 Church St., New York 7. Folder on mechanical and electric powered collators with facts, features and applications. **(144)**

Times Facsimile Corp., 540 W. 58th St., New York 19. Literature on Stenifax – a machine for making duplicating stencils and offset masters electronically. **(145)**

Triner Scale & Mfg. Co., 2714 W. 21 St., Chicago 8. Literature and price charts available on firm's line of scales. **(146)**

Victor Adding Machine Co., 3900 N. Rockwell Ave., Chicago 18. Brochure on one-key, automatic printing calculator. **(147)**



Acco Products, Div. of Natser Corp., Box 508, Ogdensburg, N. Y. Literature describing the firm's entire binder and folder line. **(148)**

Accountants' Supply House, 518 Rockaway Ave., Valley Stream, L. I., N. Y. 112-page catalog-manual featuring thousands of general office and stationery items as well as business equipment. **(149)**

American Writing Paper Corp., 10 Eagle-A Ave., Holyoke, Mass. Test kits—"Eagle-A" business papers. **(150)**

Arlington Aluminum Co., 19011 W. Davison, Detroit 23, Mich. Brochure on presentation easel, including paper pad presenta-

tions, chalkboard, charts and flannelboard. **(151)**

Arrow Fastener Co., Inc., 1 Junius St., Brooklyn 12, N. Y. Catalog #13, illustrates and describes applications of firm's line of staplers and staple gun tackers. **(152)**

Avery Adhesive Label Corp., 1616 South California Ave., Monrovia, Calif. 8-page catalog, *How to improve office efficiency with Avery pressure-sensitive labels.* **(153)**

Baltimore Business Forms Co., 3134 Frederick Ave., Baltimore 29, Md. Literature and samples available on firm's business forms. **(153A)**

Bankers & Merchants, Inc., 3229 N. Sheffield Ave., Chicago 13, 12-page reference catalog on *Marking Devices and Office Products.* **(154)**

Fred Baumgarten Exclusive Imports, 1000 Virginia Ave., Atlanta 6, Ga. Information on the firm's new plastic paper clip, and colors available. **(155)**

Beach Publishing Co., 19829 W. McNichols Rd., Detroit 19, Mich. Envelope size folder illustrating and describing Beach's *Common Sense* expense books and expense sheets. **(156)**

Bergstrom Paper Co., Highway 41, Neenah, Wisc. Sample book of *Odin Office Printing Papers* which come in three finishes, white and six colors. **(157)**

Burroughs Corp., Detroit 32, Mich. Information on supplies and accessories for the firm's business machines. **(158)**

The C-Thru Ruler Co., Hartford, Conn. Eight-page folder describes and illustrates an assortment of ruling and drawing devices. **(159)**

Carteret Printing Co., 480 Canal Street, New York 13. Catalog of stock business forms and correlated equipment, and *Paper Talk*, a dictionary of paper terms. **(160)**

Carter's Ink Co., 239 First St., Cambridge, Mass. Booklet, *How to be an Expert on Carbons and Ribbons.* **(161)**

Cel-U-Dex Corp., P.O. Box 1127, Newburgh, N. Y. Catalog, *Modern Filing and Indexing Aids for the Business of Today.* **(162)**

The Challenge Machinery Co., Grand Haven, Mich. Descriptive booklets on power and lever types for duplicator operations, and on office equipment for paper drilling, cornering, slitting, and slotting. **(163)**

Chart-Pak, Inc., 1 River Rd., Leeds, Mass. *Visualization Made Easier*, catalog illustrating adhesive-backed pressure-sensitive tapes, templates, and symbols for use in graphs, charts and layouts. **(164)**

Control Systems, Inc., 5 Beekman St., New York 38. Publications on all computing and figuring needs. **(165)**

Cummins Chicago Corp., 4740 Ravenswood Ave., Chicago 40. *For the Records* describes cutting paper handling costs, giving 21 capsule case histories. **(166)**

Cup-Pac Div., Temp-Rex Corp., 18 Orawaupum St., White Plains, N. Y. Literature on the firm's coffee break supplies and vending equipment. **(167)**

Dennison Mfg. Co., 300 Howard St., Framingham, Mass. Samples and literature on the complete Dennison line of addressing labels. **(168)**

Dresser Products Inc., P. O. Box 2035, Providence 5, R. I. Information on coded tape handling equipment and filing supplies. **(169)**

Eagle Pencil Co., Danbury Conn. *Pencil Selector* booklet helps select the correct pencil for each specific job. **(170)**

Electro-Stylus Mfg. Co., Forsyth, Mo. Information on the firm's new, modern instrument for stencil cutting, and film, metal, plastic, and glass marking. **(171)**

Esleeck Mfg. Co., Turner Falls, Mass. Sample book of thin papers, for thin letterheads, copies, records, forms and advertising. **(172)**

Estey Corp., 350 Broadway, New York 13. Booklet, *Filing Facts*, on adapting standard filing systems to open shelf filing. **(173)**

Ezyindex Products Corp., 153-13 Northern Blvd., Flushing 54, N. Y. Catalog 58, containing over 250 indexing products for filing uses. **(174)**

Faber Pencil Co., Eberhard, Crestwood, Wilkes-Barre, Pa. *Buyer's Guide*, indexed catalog of stationery supplies for general office, secretarial, and drafting use. **(175)**

The Fairgate Rule Co., Inc., Cold Spring, N. Y. Information on aluminum straight-edge rules, T-squares, triangles, knob rules, pica-agate rules, and drawing board sets. **(176)**

Federal Loose Leaf Corp., 148 Lafayette St., New York 13. Information on firm's loose leaf devices, catalog covers, and various binders. **(177)**

Filmotype Corp., 7500 McCormick Blvd., Skokie, Ill. Literature describing the "Filmotype" and its use in preparing headings for artwork and charts. **(178)**

Forms Development Corp., Lafayette & Leonard Sts., New York 13. Literature on scientific approach to use of business forms and systems. **(179)**

General Binding Corp., 1101 Skokie Highway, Northbrook, Ill. Information on plastic binding guide, and vinyl binder guide. **(180)**

George B. Graff Co., 54 Washburn Ave., Cambridge 40, Mass. Folder on Graffeo file signals, map tacks, and flags. **(181)**

Graphic Systems, 55 W. 42 St., New York 36. *Graphic Visual Control*, 24 page illustrated booklet on Boardmaster Systems for production, scheduling, etc. **(182)**

The Griffin Mfg. Co., 191 Lyndhurst St., Rochester 5, N. Y. *Precision Built Tools*, a catalog describing hand tools for hobbies, graphic arts, offices and crafts. **(183)**

Guide System and Supply Co., Inc., 335 Canal St., New York 13. Catalog #571 on filing supplies, "Transfiles," and "Guido." **(184)**

Hammermill Paper Co., 1606 East Lake Rd., Erie 6, Pa. Facts about the new Hammermill Graphicopy papers for printing, duplicating and office use. **(185)**

Philip Hano Co., Inc., Holyoke, Mass. Folder, *The Complete Line of Hano Business Systems.* **(186)**

The Lafayette Co., 120 Greenwich St., New York 6. Folder, *Postage Savings with Light Weight Papers and Envelopes.* **(187)**

Lindy Sales Co., Inc., 9601 Jefferson Blvd., Culver City, Calif. Literature and sample of the firm's non-refillable and retractable ball point pens available on request made on company letterhead. **(188)**

Michael Lith, Inc., 145 West 45th St., New York 36. Literature on the firm's paper cutters, office and duplicating department cutting machines; and paper trimmers. **(189)**

Maggie Magnetic, Inc., Visual Aids Div., 39 W. 32 St., New York 1. *Magnetic Visual Control Systems.* **(190)**

Joshua Meier Co., Inc., 601 West 26 St., New York 1. Two catalogs on ring binders, and presentation binders—with or without sheet-protectors. **(191)**

Microdealers, Inc., 1560 Trapelo Road, Waltham 54, Mass. 16-page booklet listing cities in which firm's national microfilm services and equipment are available. **(192)**

M. C. Mieth Mfrs. 665 Herbert St., Port Orange, Fla. Catalog M20 illustrating complete line of hand and desk punches. **(193)**

Millers Falls Paper Co., Millers Falls, Mass. Booklet, *The ABC of Ezerase Papers, Ezerase Bond and Onion Skin.* **(194)**

Mimeo Mfg. Co. Inc., 401 Broadway, New York 13. *Stencil Stylus*, brochure on the firm's complete line of 25 styli. **(195)**

Nascon "At-A-Glance" Products Div., Eaton Paper Corp., Pittsfield, Mass. Catalog of personal and business records for increased efficiency. **(196)**

Nashua Corp., Nashua, N. H. Booklet on gummed tape and dispensers. **(197)**

National Blank Book Co., Holyoke, Mass. 192-page *Better Records* catalog in color showing over 2000 forms and binders for record keeping. NOTE: This item is priced

at $1. Requests should be addressed directly to the company.

Nekoosa-Edwards Paper Co., Port Edwards, Wis. Catalog on *Helpful Suggestions for Using Office Duplicating Equipment.* **(198)**

New England Paper Punch Co., 89 Washington Ave., Natick, Mass. Envelope folder describing complete line of Clix desk-type paper punches. **(199)**

Newport Business Forms Co., Inc., P.O. Box 976, Newport News, Va. Stock business form catalog covering manifold books, voucher and one-time carbon sets. **(200)**

Norma Pencil Corp., 137 W. 14th St., New York 11. Illustrated colored catalog sheet showing four-color and three-color pens and mechanical pencils. **(201)**

Ozalid, Div. of General Aniline & Film Corp., Johnson City, N. Y. Literature is available on firm's one-writing systems for purchasing, accounting, production control and other departments. **(201A)**

The Paper Mate Co., 444 Merchandise Mart, Chicago 54. Literature on new Office Mate pen with product description and prices. **(202)**

Parker Pen Co., Janesville, Wis. *Parker Desk Sets for Home and Office* is catalog of newest desk pen sets, of fountain and ballpoint type in woods, plastics and stone. **(203)**

Parsons Paper Co., Holyoke, Mass. Booklet, *How to Get What You Need in Record-Keeping Papers and Index Cards.* **(204)**

Polychrome Corp., 2 Ashburton Ave., Yonkers 2, N. Y. *Stencil Process and Supply Catalog* reviews the firm's complete mimeo duplicating line. **(205)**

Port Huron Sulphite & Paper Co., Port Huron, Mich. Brochure describing economy of using Huron Copysette, manifold carbon paper sets. **(206)**

The Recordoplate Co., 130 No. Fair Oaks Ave., Pasadena, Calif. Catalog on the firm's loose leaf and visible ring books to help industry, business and traveler. **(207)**

Reed Mfg. Co., 1045 Main St., Waltham 54, Mass. Literature on security bars for office files, and on triple combination padlocks. **(208)**

Reliance Pen & Pencil Corp., 22 S. Sixth Ave., Mount Vernon, N. Y. Illustrated catalog; describing a wide selection of pencils, ball point pens, and related office supplies. **(209)**

Rite-Line Corp., 4209 39 St., N.W., Washington 16, D. C. Folder and catalog sheet describing Rite-Line copyholder and its accessories. **(210)**

Rittenhouse Paper Co., 6405 S. Wentworth Ave., Chicago 21, Ill. Dealers' price schedule and resale list on cash registers, adding machines, teletype rolls, and office papers. **(211)**

Royal McBee Corp., Westchester Ave., Port Chester, N. Y. Brochure lists features of the Swing Hinge Binder in all models, illustrating a method of adding or deleting material. **(212)**

Schlegel Mfg. Co., P. O. Box 197, 1555 Jefferson Rd., Rochester 1, New York. Literature on the firm's Pull Fasteners answers questions on paper-fastening problems. **(213)**

The C. E. Sheppard Co., 44-10Y 21 St., Long Island City 1, N. Y. A set of 3 booklets containing information on Multi-Rite "one-write" pegboard accounting systems for accounts receivable and payrolls. **(214)**

The Shredmaster Corp., 75 Varick Street, New York 13. Information on the firm's paper shredders. **(215)**

Charles C. Smith, Inc., Exeter, Neb. Illustrated catalog of firm's line of metal and cloth index tabs. **(216)**

Spot Carbon Products, 54 Lafayette St., New York 13. Literature on use of spot carbonized business forms. **(217)**

Standard Duplicating Machines Corp., 1935 Parkway, Everett 49, Mass. *The Famous Standard Single Writing System* folder showing how to simplify handling of orders, shipments and invoices. **(218)**

Standard Manifold Co., 333 W. Lake St., Chicago. Literature on STAMCO continuous Repeat-O-Pak, reusable carbon paper systems for billing machines. **(219)**

The Staplex Co. 777 Fifth Ave., Brooklyn 32, N. Y. *Fully Automatic Stapling* shows how automatic electric stapling has become a necessity in modern business. **(220)**

Stock Forms Co., 491 S. Dean St., Englewood, N. J. *Rediform Stock Speedisets* describes uses and economies of stock one-time carbon interleaved, snap-apart forms. **(221)**

Swan Pencil Co., Inc., 221 Fourth Ave., New York 3. Literature and samples on all types of woodcase pencils. **(222)**

Swingline Inc., 32-00 Skillman Ave., Long Island City 1, N. Y. 32-page catalog on Swingline staplers, staples and office specialties. **(223)**

The Tabulating Card Co., 32 Nassau St., Princeton, N. J. *A Super-Highway for Your Tabulating Card Needs* gives information on tabulating cards for electronic accounting machines. **(224)**

Tauber Plastics, Inc., 200 Hudson St., New York 13, N. Y. Booklet on plastic binding material and equipment. **(225)**

Tops Business Forms, 107 N. Wacker Drive, Chicago 6. 28-page illustrated office form catalog with new collection forms. **(226)**

Transkrit Corp., 704 Broadway, New York 3. Free samples and literature on Transkrit hot wax spot carbonizing process. **(227)**

Triner Scale & Mfg. Co., 2714 W. 21 St., Chicago 8. Latest advances in light capacity postage scales. **(228)**

Wellington Sears Co., 111 W. 40 St., New York 18. *All Hands Go for Clean Cotton Towels* is brochure explaining cotton towel service. **(229)**

Van Son Holland Ink Corp. of America, 92 Union St., Mineola, N. Y. Color catalog showing more than 50 inks for offset machines. **(230)**

L. D. VanValkenburg Co., P.O. Box 190, Holyoke, Mass. Pamphlet describing stainless steelgrip clip uses for office, factory, home and automobile. **(231)**

Waxon-Carboff, Inc., 8 Commercial St., Rochester 14, N. Y. Folder containing samples of Carboff self-duplicating paper. **(232)**

Weber Marketing Systems, Div. of Weber Addressing Machine Co., Inc., 215 E. Prospect Ave., Mt. Prospect, Ill. *49 Marking Jobs Done Faster, Easier* is brochure on carton addressing, marking and labeling. **(233)**

Byron Weston Co., Dalton, Mass. Booklet, Eighth Edition of the Red Book, *Facts on Paper Buying, Uses and Sizes.* **(234)**

Write, Inc., 420 Lexington Ave., New York 17. Brochure on the new Statesman line of carbon papers and inked ribbons. **(235)**

Zephyr American Corp., 95 Morton St., New York 14. Information on the firm's Rolodex rotary card files; Autodex telephone list finders, and Lettadex letter openers. **(236)**

Zip-O-Riter Products, 3875 Garland St., Wheat Ridge, Col. *Simplicity in Hand Addressing* is catalog illustrating firm's masters used for addressing and accounting form heading writing. **(237)**

MISCELLANEOUS

Aero Service Corp., 210 E. Courtland St., Philadelphia 20. Catalog. *New 3-D Relief Maps for Offices,* describes office maps of U. S., world, Canada and S. America. **(238)**

Allied Radio Corp., Chicago. General 1959 4542-page catalog lists company's line of electronic parts and equipment including high-fidelity components. **(239)**

American Institute of Certified Public Accountants, 270 Madison Ave., New York 16. Catalog of publications on accounting, tax, and related subjects. **(240)**

American Management Assn., Inc., 1515 Broadway, New York 36. An index of books, periodicals, and films of the association (1957-1958). **(241)**

Baker-Roos, Inc., 602 W. McCarty St., Indianapolis 6, Ind. Literature on scaffolding with adjustable platforms to position workmen at efficient heights. **(242)**

Bankers Box Co., 2607 N. 25th Ave., Franklin Park, Ill. *Manual of Record Storage Practice* with suggested retention periods. **(243)**

The Bassick Co., 3045 Fairfield Ave., Bridgeport, Conn. *Floor Protection Equipment,* 8-page catalog covering firm's products for the office. **(243A)**

Bauer-Lee & Co., 136 E. Montecito Ave., Sierra Madre, Calif. Literature on billfolds, eyeglass cases, and pocket protectors. **(244)**

Burroughs Corp., Detroit 32, Mich. Burroughs calculators and their applications on peg board accounting. **(245)**

Business Electronics, Inc., 420 Market St., San Francisco 11. Brochure, *Programming for Business Computers,* describes correspondence course on EDP principles and techniques. **(246)**

Canning, Sisson & Associates, 1140 S. Robertson Blvd., Los Angeles 35. Descriptive literature outlines the 180-page special report, *Cutting the Cost of Your EDP Installation.* **(247)**

Carteret Printing Co., 480 Canal St., New York 13. *Paper Talk,* a dictionary of paper terms. **(248)**

Cartoons-Of-The-Month, Roslyn, N. Y. Literature tells of cartoons which are offered for company publications. **(249)**

The Celotex Corp., 120 So. La Salle St., Chicago 3. *1959 Catalog of Acoustical Materials.* **(250)**

Clad-Rex Corp., 2101 S. Indiana Ave., Chicago 16. Booklet describes the construction applications of Clad-Rex prefinished wall panels. **(251)**

Clarotype Co., Inc., 261 Broadway, New York 7. Circular with tips and hints for typists. **(252)**

Comptometer Corp., Compto-Pak Div., 1735 N. Paulina St., Chicago 22. 32-page booklet illustrates the packaging capabilities of Compto-Pak Cutter and Crimper. **(253)**

Cormac Photocopy Corp., 80 Fifth Ave., New York 11. *The Polycopy Story,* dealing with methods of making an unlimited number of low-cost copies from one master copy. **(254)**

Cummins-Chicago Corp., 4740 N. Ravenswood Ave., Chicago 40. Booklet dealing with methods of savings profits ordinarily lost through fraud and embezzlement. **(255)**

Denham & Co., 925 Book Bldg., Detroit 26. Catalog describing and illustrating the Geerpres line of floor cleaning equipment. **(256)**

Desks, Inc., 71 Fifth Ave., New York 3. Advice on buying is contained in *Your Guide to Buying Office Furniture.* **(257)**

Diebold, Inc., Flofilm Div., Box 127, Norwalk, Conn. Booklet, *Procedural Microfilming, New Techniques in Clerical Cost Control.* **(258)**

John Diebold & Associates, Inc., 40 Wall St., New York 5. Reprint of speeches including *Office Supplies and Services,* (Management Consultants). **(259)**

E. I. du Pont de Nemours & Co., Inc., 2537 Nemours Bldg., Wilmington 98, Del. Fabrilite Sample Card, containing swatches of all colors in Cordero line of vinyl upholstery. **(260)**

Ebco Manufacturing Co., 265 N. Hamilton Rd., Columbia 13, O. Booklet, *How to Cut Coffee-Break Time 50%,* on Hot 'N Cold Water Coolers and how they serve the office. **(261)**

Thomas A. Edison Industries, Voicewriter Div., West Orange, N. J. *10 Minutes to Better Letters and Reports,* a digest of good writing techniques for more effective business correspondence. **(262)**

Electronic Accounting Card Corp., P. O. Box 1088, High Point, N. C. Brochure, *Why Your Tabulating Cards Must Be Produced with Laboratory Care.* **(263)**

Equitable Leasing Corp., 246 Charlotte St., Asheville, N. C. Literature on the leasing of business machines and office equipment. **(264)**

GR Products, Inc., 2417 Eastern Ave., S.E., Grand Rapids, Mich. Reference guide about the Richland System of five types of wall construction. **(265)**

General Binding Corp., 1101 Skokie Highway, Northbrook, Ill. Decorated guide presenting various ways of binding reports, manuals and catalogs with plastic. **(266)**

Grant Pulley & Hardware Corp., High St., West Nyack, N. Y. Condensed catalog containing resume of Grant Commercial & Hospital Cubicle. **(267)**

Huntington Laboratories, Inc., Huntington, Ind. Pamphlet dealing with sanitation products and maintenance equipment. **(268)**

Ideas, Inc., 214 Ivinson Ave., Laramie, Wyo. Literature on eliminating hazardous over-the-floor electric cords to office machines by using "Electriduct." **(269)**

Lansdale Products Corp., Box 568, Lansdale, Pa. Folder, *Control is the Modern Way to Business Efficiency,* describes "Planomatic" controls. **(270)**

Lassco Products, Inc., 485 Hague St., Rochester 6, N. Y. Folder, *Low Cost Equipment for Bindery Service in the Print Shop.* **(271)**

LeFebure Corp., 716 Oakland Rd., Northeast, Cedar Rapids, Iowa. Booklet, *From Here to Electronics,* points out the necessary steps in conversion to electronic posting in banks. **(272)**

Walter G. Legge Co., Inc., 101 Park Ave., New York 17. Safety floor maintenance cleaners and polishes are treated in *Mr. Higby and the Gremlin.* **(273)**

Lehigh, Inc., Easton, Pa. Booklet traces a new way to solve the coffee-break problem in offices. **(274)**

Luminous Ceilings, Inc., 2500 W. North Ave., Chicago 47. Booklet describing eleven different ceiling systems including types of lighting equipment. **(275)**

Lundstrom Laboratories, Inc., P.O. Box 750, Herkimer, N. Y. Brochure on "Densiwood" posts and strips for office desks. **(276)**

Marchant Calculators, 1475 Powell St., Oakland 8, Calif. 72-page booklet, *Statistical Quality Control in Action,* an illustrated description of applied quality control techniques. **(277)**

Mason Stationery Products, Inc., 476 Broome St., New York 13. Literature on leather desk sets, desk pads and calendars, photo albums and accessories. **(278)**

L. & C. Mayers/Temple, Inc., 516 W. 34th St., New York 1. Diamonds, gifts, jewelry and other merchandise for firms and business executives are listed in a 600-page mail order catalog. **(279)**

Mercury Business Machines Co., Inc., 900 Broadway, New York 3. *Autodynam* presents the story of a propellant ink dispenser for Roto Silk Screen Stencil Duplicators. **(280)**

G. & G. Merriam Co., Springfield, Mass. Booklet, *The Only Way to Get Letter-Perfect Typing,* on how to place dictionaries in an office. **(281)**

Miller Products Co., Inc., 29 Warren St., New York 7. *Miller's Buying Guide to Industrial Rubber Products* includes facts on rubber clothing, cord, matting and tubing. **(282)**

Milo Harding Co., 138 Tempo Building, Monterey Park, Calif. *Tempo Tips to Stencil Typists,* a question and answer format folder describing the methods and short cuts for stencil preparations. **(283)**

The Mosler Safe Co., 320 Fifth Ave., New York 1. Literature on the firm's machine bookkeeping safe, an all-in-one protection for records. **(284)**

Mutual of New York, New York 19. *Filing Manual,* booklet on filing techniques and procedures. **(285)**

Muzak Corp., 229 Fourth Ave., New York 3. Leaflets, *How Background Music Affects Profits,* and *How To Estimate Your Sound System Requirements.* **(286)**

Mystik Adhesive Products, Inc., 2635 N. Kildare Ave., Chicago 39. Step-by-step description of how to repair books, albums and portfolios is offered in *Fix Books Like New.* **(287)**

Naremco Services, Inc., 555 Fifth Ave., New York 17. Methods for reducing paperwork are traced in *Paperwork—A Liability or an Asset?* **(288)**

Otis Elevator Co., 260 W. Eleventh Ave., New York 1. General booklet, *Hints for Better Elevatoring*, outlines various considerations that influence the planning of elevator systems. **(289)**

Peerless Photo Products, Inc., Shoreham, N. Y. *Office Copy Machines . . . and how to choose the one to suit your needs* is informative four-page folder. **(290)**

Pitney-Bowes, Inc., Walnut & Pacific Sts., Stamford, Conn. Booklet, *29 Timely Mailing Tips*, includes information on business mailing. **(291)**

W. H. Pusch, 427 W. Lynwood, San Antonio 12, Tex. Circular describing the Insurater, a slide rule which derives the amount of premium earned on auto-property insurance, pro-rate or short-rate, with one simple setting. **(292)**

Robertson Photo-Mechanix, Inc., 7440 Lawrence Ave., Chicago 31. Catalog of printing frames, tables, sinks, file cabinet and trimmer. **(293)**

Record Controls, Inc., 209 S. La Salle St., Chicago 4. Paper bound booklet, *Retention and Preservation of Records with Destruction Schedule.* NOTE: This item is priced at $4. Requests should be addressed directly to the company.

Rogersnap Business Forms, P.O. Box 10425, Dallas, Tex. An analysis entitled *Comparative Costs of Carbon, Paper and Carbon Second Sheets.* **(294)**

The Ronald Press Co., 15 E. 26th St., New York 10. Literature on *Office Management Handbook* which deals with office functions, equipment and organization. **(295)**

Statikil Inc., 1220 West 6th St., Cleveland 13, Ohio. Literature on a compound for the effective relief of static electricity in printing. **(296)**

Stenographic Centering Scales, 1511 N. Algona, Dubuque, Ia. Literature on a new teaching and typing aid for centering material horizontally. **(297)**

Stromberg Time Corp., 135 S. Main St., Thomaston, Conn. Literature on transactor system of data gathering and communication to data processing centers. **(298)**

Supreme Steel Equipment Corp., 53rd St., and 1st Ave., Brooklyn, N. Y. 16-page *Conserv-a-File* color catalog on open shelf filing. **(299)**

Systematics Inc., 60 E. 42 St., New York 17. *Systematics Intercouplers*, a new concept in information processing for business and industry. **(300)**

Traveletter Corp., Greenwich 6, Conn. Brochure on firm's credit facilities and services. **(300A)**

Underwood Corp., 1 Park Ave., New York 16. Practical facts and tips for the secretary are outlined in *The Girl With the Halo.* **(301)**

Van D. Mark, P.O. Box 44, St. Clair, Mich. *Inventory Control Elements*, a brochure discussing nine principal inventory control influences. **(302)**

Woodlets Inc., 2048 Niagara St., Buffalo 7, N. Y. Literature on Ozium, the glycolized air freshener and sanitizer for office use, and Ozicote, the silicone lens cleaner spray. **(303)**

If you wish any of the items listed in this section, you may request them by using this coupon. The numbers on the coupon correspond to the numbers of the items in the preceding list. Merely check the numbers of the items you wish and forward the coupon to Office Management.

OFFICE MANAGEMENT
212 Fifth Ave., New York 10, N. Y.
Please send the literature indicated by the numbers checked on this coupon.

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☐ 4	☐ 29	☐ 54	☐ 79	☐ 104	☐ 128
☐ 5	☐ 30	☐ 55	☐ 80	☐ 105	☐ 129
☐ 6	☐ 31	☐ 56	☐ 81	☐ 106	☐ 130
☐ 7	☐ 32	☐ 57	☐ 82	☐ 107	☐ 131
☐ 8	☐ 33	☐ 58	☐ 83	☐ 108	☐ 132
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Associations with an interest in office management

American Bankers Association
12 E. 36 St., New York 16.

American Institute of Certified Public Accountants
270 Madsison Ave., New York 16.

American Institute of Electrical Engineers
Publications Department. 500 Fifth Ave., Suite 7, New York 36.

American Institute of Management, Inc.
125 E. 38 St., New York 16.

American Management Association
1515 Broadway, New York 36.

American Personnel and Guidance Association
5040 Grace Ave., St. Louis 16. Miss Marie Bergmann.

American Records Management Association
President: John F. X. Britt, Ford Motor Co., Detroit.

American Society for Personnel Administration
Room 5, Kellogg Center, East Lansing Mich.

American Society for Quality Control
70 E. 45 St., New York 17.

Association for Computing Machinery
2 E. 63 St., New York.

Association of Consulting Management Engineers, Inc.
347 Madison Ave., New York 17.

Association of Records Executives and Administrators
Robert W. Humphrey, President, New York Stock Exchange, 11 Wall St., New York 5. A. A. Deter, Public Relations Chairman, 15 E. 41 St., New York 17.

Business Forms Institute
President: R. S. Daugherty, Shelby Salesbook Co., Shelby, Ohio.

Connecticut Personnel Association
Robert M. Engberg, Wallace Silversmiths, Wallingford, Conn.

Controllers Institute of America
2 Park Ave., New York 16.

Industrial Management Society
Suite 1310, 330 S. Wells St., Chicago 6.

Institute of Management Sciences
Harold H. Cauvet, Business Manager, 250 North St., White Plains, N. Y.

Institute of Radio Engineers, Inc.
1 E. 79 St., New York.

Instrument Society of America
313 Sixth Ave., Pittsburgh 22.

Insurance Accounting and Statistical Association
President: L. M. Cox, Employers Mutual Liability Insurance Co., Wausau, Wis.

International Management Association, Inc.
1515 Broadway, New York 36.

Life Office Management Association
110 E. 42 St., New York 17.

Management Development Center
California Institute of Technology Pasadena, Calif.

National Association of Cost Accountants
505 Park Ave., New York 22.

National Association of Manufacturers
2 E. 48 St., New York 17.

National Association of Purchasing Agents
11 Park Place, New York 7.

National Association of Suggestion Systems
25 E. Jackson Blvd., Chicago 4.

National Business Forms Associates
207 E. Broward Blvd., Fort Lauderdale, Fla.

National Industrial Conference Board, Inc.
460 Park Ave., New York 22.

National Institute of Governmental Purchasing, Inc.
1001 Connecticut Ave., N. W., Washington 6, D. C.

National Machine Accountants Association
208 Main St., Paris, Ill.

National Management Association
321 W. First St., Dayton 2, Ohio.

National Microfilm Association
19 Lafayette Ave., Hingham, Mass.

National Office Management Association
1927 Old York Road, Willow Grove, Pa.

National Records Management Council, Inc.
555 Fifth Ave., New York 17.

National Secretaries Association (International)
222 W. Eleventh St., Kansas City 5, Mo.

Newspaper Personnel Relations Association
William Forrester, Secretary-Treasurer. The Pittsburgh Press, Pittsburgh 30.

Office Equipment Manufacturers Institute
777 14 St., N. W., Washington, D. C.

Office Executives Association of New York, Inc.
530 Fifth Ave., New York 36.

Office Management Association of Chicago
105 W. Madison St., Chicago 2.

Operations Research Institute, Inc.
41 Fifth Ave., New York 3. P. O. Box 487, Princeton, N. J.

Railways Systems and Procedures Association
357 Union Station, Washington 2, D. C.

Record Controls, Inc.
20 S. LaSalle, Chicago.

Records Management Association of Chicago
P. O. Box 651, Chicago 90. President: Mrs. Melba Comstock, 201 W. 63 St.

Records Management Association of New York
President: Miss Anna Brennan, Equitable Life Assurance Society of the U. S., 393 Seventh Ave., New York.

Richard Rimbach Associates, Inc.
845 Ridge Ave., Pittsburgh 12.

Safe Manufacturers National Association, Inc.
366 Madison Ave., New York 17.

Society for Advancement of Management, Inc.
74 Fifth Ave., New York 11.

Systems and Procedures Association of America
4463 Penobscot Bldg., Detroit 26.

Wood Office Furniture Institute
1414 I St., Washington 1, D. C.

Preview of events during 1959

AMA Seminar: Automation in the Office—Principles, Pitfalls, Techniques and Applications. New York, January 19-23.
Sponsor: American Management Association.
Place: Astor Hotel.

ABA National Credit Conference. Chicago, January 22-23.
Sponsor: American Bankers Association.
Place: La Salle Hotel.

Eleventh Annual Industrial Engineering Institute. Berkeley, Calif., February 6-7.
Sponsor: University of California.
Place: Berkeley Campus.

ABA Midwinter Trust Conference. New York, February 9-11.
Sponsor: American Bankers Association.
Place: Waldorf-Astoria Hotel.

AMA Seminar: Decisions and Policies in the Purchase and Use of Office Machines and Equipment. Dallas, February 18-20.
Sponsor: American Management Association.
Place: Statler-Hilton Hotel.

NAA Regional Conference. Tulsa, Okla., February 27-28.
Sponsor: National Association of Accountants.
Place: Hotel Mayo.

CIA Southern Regional Conference. New Orleans, March 5-7.
Sponsor: Controllers Institute of America.
Place: Roosevelt Hotel.

ABA Installment Credit Conference. Chicago, March 9-11.
Sponsor: American Bankers Association.
Place: Conrad Hilton Hotel.

AMA Seminar: Reducing and Controlling the Costs of Office and Administrative Overhead. New York, March 9-11.
Sponsor: American Management Association.
Place: Astor Hotel.

NAA Conference: Experience with Direct Costing. Cleveland, March 12-14.
Sponsor: National Association of Accountants.
Place: Hotel Statler.

Eighth Annual Systems and Procedures Conference. San Francisco, March 20.
Sponsor: University of California.
Place: Fairmont Hotel.

AMA Seminar: Developing and Applying Work Measurement and Standards in Administrative Operations. New York, March 30—April 3.
Sponsor: American Management Association.
Place: Astor Hotel.

CPA Ninth Annual Conference. Yale University, March 31.
Sponsor: Connecticut Personnel Association with the cooperation of Department of Industrial Administration, Yale University.
Place: Strathcona Hall, Yale University.

Conference: Human Factors in Supervision and Leadership. Berkeley, Calif., April (exact date not yet set).
Sponsor: University of California.
Place: Berkeley Campus.

Southeastern Personnel Conference. Durham, N. C., April 1-3.
Sponsor: Duke University.
Place: Duke University.

Annual Meeting and Convention of the National Microfilm Association. Washington, D. C., April 2-5.
Sponsor: National Microfilm Association.
Place: Mayflower Hotel.

NAA Regional Conference. Baltimore, Md., April 3-4.
Sponsor: National Association of Accountants.
Place: Lord Baltimore Hotel.

Life Office Automation Forum. Chicago, April 13-15.
Sponsor: Life Office Management Association.
Place: The Drake Hotel.

AMA Clinic: Paperwork in the Purchasing—Accounts Payable Cycle. New York, April 15-17.
Sponsor: American Management Association.
Place: Astor Hotel.

CIA Eastern Regional Conference. Richmond, Va., April 19-21.
Sponsor: Controllers Institute of America.
Place: John Marshall Hotel.

AMA Seminar: Managing the Office Work Simplification Program. New York, April 20-22.
Sponsor: American Management Association.
Place: Astor Hotel.

Southern California Business Show. Los Angeles, April 21-24.
Sponsor: The National Association of Accountants, Los Angeles Chapter.
Place: Ambassador Hotel.

AREA Second Annual Records Management Conference. New York, May (exact date to be announced).
Sponsor: Association of Records Executives and Administrators.
Place: To be announced.

Labor Relations and Arbitration Conference. San Francisco, May (exact date to be announced).
Sponsor: University of California.
Place: Fairmont Hotel.

Third U. S. World Trade Fair. New York, May 8-19.
Sponsor: U.S. World Trade Fair.
Place: New York Coliseum

ABA Southern Regional Trust Conference. Birmingham, Ala., May 14-15.
Sponsor: American Bankers Association.
Place: Dinkler-Tutwiler Hotel.

IASA Annual Conference. Atlantic City, N. J., May 17-20.
Sponsor: Insurance Accounting and Statistical Association.
Place: Ambassador Hotel.

AMA Seminar: Developing a Sound Records Retention Program. Chicago, May 18-20.
Sponsor: American Management Association.
Place: LaSalle Hotel.

CIA Western Regional Conference. Santa Barbara, Calif., May 21-23.
Sponsor: Controllers Institute of America.
Place: Santa Barbara Biltmore Hotel.

NOMA Annual Office Exposition and 40th International Conference. New Orleans, May 24-27.
Sponsor: National Office Management Association.
Place: Municipal Auditorium and Roosevelt Hotel.

AIB Conference. Philadelphia, June 1-5.

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Esleeck onion skin papers are easy to handle and erase, extra strong because they're made of tough cotton fiber. Reduce typing and mailing costs. Take up less valuable file space. Write for free sample book today!

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FIDELITY Onion Skin 100% Cotton Fiber

SUPERIOR Manifold 25% Cotton Fiber

CLEARCOPY Onion Skin 25% Cotton Fiber

white *(regular and fluorescent)*
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Manufacturers' list—

(*From page* 145)

All Metal Partition Co., Inc., 194-204 Du Pont St., Brooklyn 22, N. Y. (PS-NI)

American Accordian-Fold Doors, Inc., 175-35 Liberty Ave., Jamaica 33, N. Y. (FW)

American Bamboo Corp., 171-06 Jamaica Ave., Jamaica, N. Y. (FW)

Art Metal Construction Co., Jones & Gifford Aves., Jamestown, N. Y. (FW; PF; PS)

Art Steel Co., 170 W. 233 St., New York 63. (PF; PS)

Bemis Bro. Bag Co., 408 Pine St., St. Louis 2, (FW)

E. J. Boyle Div., Aetna Steel Products Corp., 14 Charlton St., New York. (PS-NI)

Browne-Morse Co., Muskegon, Mich. (PS)

The Brunswick-Balke-Collender Co., 623 S. Wabash Ave., Chicago 5. (FW)

The Celotex Corp., 120 S. La Salle St., Chicago 3. (PS-NI)

Cole Steel Equipment Co., Inc., 415 Madison Ave., New York. (PS)

Corry-Jamestown Mfg. Corp., Corry, Pa. (PF; PS)

D & L Office Furniture Co., 61 W. Hubbard, Chicago. (PF-NI; PS-NI)

L. A. Darling Co., Bronson, Mich. (PS-NI)

GR Products, Inc., 2147 Eastern Ave., S.E., Grand Rapids, Mich. (PS)

The General Fireproofing Co., 413 Dennick Ave, Youngstown, Ohio. (PS)

General Plywood Corp., Exec-Unit Office Partitions Div., Market at 32 St., P.O. Box 1403, Louisville 1, Ky. (PS)

General Steel Products Corp., Flushing 55, N. Y. (PS-NI)

The Globe-Wernicke Co., Norwood, Cincinnati 12, Ohio. (PF;PS)

The E. F. Hauserman Co., 6800 Grant Ave., Cleveland. (PF; PS)

Robert Haws Co, 15722 Telegraph Rd.. Detroit 39. (FW)

Hemisphere Steel Products Corp., 263 Kent Ave., Brooklyn, N. Y. (PS)

Hough Mfg. Corp., Janesville, Wis. (FW)

Johns-Manville, 22 E. 40 St., New York 16. (PS)

Korda Industries, 20 W. 46 St., New York 19. (PF-NI; PS-NI)

Marsh Wall Products, Inc., Dover, Ohio. (MI-Marlite panels, usable in partitions-NI)

The Mills Co., 965 Wayside Rd., Cleveland 10. (PS)

Milwaukee Stamping Co., Ferrometal Partitions Div., 2530 W. National Ave., Milwaukee 4, Wis. (PS)

National Steel Partition Co., Inc., 600 E. 156 St., New York 55. (PS)

New Castle Products, Inc., New Castle, Ind. (FW)

Peerless Steel Equipment Co., Unruh & Hasbrook Aves., Philadelphia 11. (PS)

Richards-Wilcox Mfg. Co., Aurora, Ill. (FW)

Rockaway Metal Products Corp., Marnay Sales Div., 1270 Broadway, New York 1. (PS)

Security Steel Equipment Corp., Avenel, N. J. (PF; PS)

Sorkin Enterprises, 11 Broadway, New York 4. (PF)

Steel Partitions Inc., P.O. Box 807, Jamestown, N. Y. (PS)

Steelcase, Inc., 1491 Division Ave., S., Grand Rapids, Mich. (PS-NI)

U. S. Gypsum, 300 W. Adams St., Chicago 6. (PS)

Unistrut Products Co., 933 Washington Blvd., Chicago 7. (PS)

United States Plywood Corp., 55 W. 44 St., New York 36. (PS)

Virginia Metal Products, Inc., Metlwal Div., 111 Wyoming St., Syracuse 4, N. Y. (PS)

Weber Showcase & Fixture Co., Inc., 5700 Avalon Blvd., Los Angeles. (PF; PS)

White Partitions, Inc. P.O. Box 48, Readville 37, Mass. (PS)

Yawman & Erbe Mfg. Co., Inc., 1099 Jay St., Rochester 3, N. Y. (PS)

Office layout—

(*From page* 53)

In these sub-columns, code symbols or abbreviations are used for standard equipment, as:

a. "Desk" "D" is used for a regular desk; "S" for a secretarial or typists' desk; "T" for a table, and "D.T." for a desk-table arrangement. Electrical machines, either on the desk, or separate from the desk, are listed by abbreviations. This information is necessary to indicate the number of electric outlets needed for the work station. Under the telephone sub-column, the number of phones needed by the individual should also be indicated by a 1 or 2.

Column 9—"Other Special Equipment." Such things as files, bookcases, visitors' chairs, etc., needed by the individual worker, are listed here.

Column 10—"Contacts with Other Departments." Listed here are the departments other than his own with which the individual worker has most frequent contact, and the approximate frequency of such contacts. This will help not only in locating departments which must work together closely in areas convenient to each other, but will also aid in placing the individual worker in the particular area of his department where contact with the second department may be made most easily. It will also aid the space planner on an overall basis to estimate how much traffic must be anticipated within the department, and so help him in planning aisles and corridors.

With the completion of this first form by all departments, the company has a complete record of the way its present space is apportioned—the first step for planning future space requirements in a scientific fashion. But continuing expansion of the business, with accompanying expansion of personnel needs, should also be anticipated in any well-designed space study for a modern company. How can such future space needs be anticipated?

Usually the best way to arrive at a reliable estimate of what such needs may be is to poll each department to see just how much a given expansion of the company's business would affect the particular department's space needs. One way of doing this is to send out an administrative memo requiring each department to estimate how many additional workers or machines it would need if the company's gross annual sales volume were to be increased by amounts like $1,000,000, $5,000,000, or $10,000,000, or whatever is appropriate in terms of company size. Then by comparison of departmental estimates with management's own forecasts of the company's probable increase in sales volume over the next five, ten or twenty year period, some planned and logical provision for expansion space can be made.

Normally, when a company rents, builds, or modernizes space for new occupancy, it should plan the original office space on liberal enough standards to be adequate for anticipated personnel expansion during the next five-to-ten year period. In other words, individual space standards should be set high enough to permit any addi-

tional workers that might reasonably be added in such a period to be accommodated by contraction of these standards. In addition, a company should allow for a "pre-planned" expansion factor beyond the ten-year point. In the case of a company constructing its own building, the normal procedure would be to have its building designed in such a way that it could physically be expanded at some time in the future by the addition of a new wing or extension or added floors. Provisions for the new wing or extension would be made in the original design, even though it would not be built for some years after construction of the original building. Thus, when the addition is eventually built, it will be compatible functionally with the original, both in terms of appearance and interior work flow and departmental groupings. In the case of rented or modernized space, the "preplanned expansion" factor, beyond the reverse space built into the first office occupied, would be covered by options or by renting such space, and then subletting it to other tenants on additional floors within the building.

"Future workers" listed

These are the principles by which future expansion needs can be anticipated and provided for. How are these principles put into action in the space planning stages? Our departmental memo has gone out; the department heads have anticipated as best they can what their additional needs in terms of personnel and machines would be for various given increases in total sales volumes. How are these figures incorporated into the space planner's total figures?

This is accomplished by means of the same space forms used in the survey of existing space. Again each worker in the department is listed, the equipment he has, whether he occupies private office or general office space. But now, in addition, according to the "increase in sales" figures which management has determined should be the controlling factor in planning expansion requirements, each department head also lists additional workers he would need for the increased work load if the projected sales increase figure were reached. Information is entered as to whether these currently non-existent workers would occupy general or private office space, what equipment they would need, etc. This is of course done solely on the basis of job titles.

The analysis form for projected space also indicates requirements the department would have under the anticipated expansion for additional special rooms, conference rooms, etc.

But on this second go-round of the space allotment form, the department liaison person makes one significant omission. He does not enter figures for the individual space to be occupied for each worker. For the purpose of this set of figures is determination of the new space needs of the company. In compiling these needs, the new individual space allotment per worker decided on by the company will be used as the key factor. Thus, the square foot columns on the form on its second journey through the departments are left blank to be filled in subsequently by the space administrator.

The space administrator now goes through these second forms, entering the approved individual space allotments for each grade of workers, after each worker's name. He fills in figures, too, for the workers not presently on the staff, who would be added if the company were to expand at the anticipated rate.

This completed, the space administrator reviews with each department head the space allotted each of his workers to make sure that special cases demanding some compromise with the basic space allotment are covered. The space administrator also studies each department's special areas, and enters the figures for the space occupied by them on both sets of forms. Once each department head has had a chance to review his space allotment figures for each of the department's workers, the planner is ready to go ahead with the next stage of his work.

As each analysis sheet, both on the first study of existing space and on the second survey of projected space is completed, the space planner totals the sub-columns of Columns 3, 4, 5 and 6 so that he has in summary form at the bottom of each sheet or the end of the departmental roster, if the last page does not take a full sheet, the total number of male personnel, total number of female personnel, total of all personnel, total square foot area given to private offices, number of people housed in private offices, total of square feet given to working space in general offices, and total number of personnel working in general offices.

From these last two general office figures he derives the average number of square feet per worker in general office areas. Similar totals can be found for special areas, number of telephones, electrical machines, etc. Thus, our space analysis sheets not only give individual information for each person—current and future—listed on each sheet, but also summary information for all persons and equipment within each department.

These completed analysis sheets are now reviewed by the entire space planning committee, if the company has appointed one to work with the space administrator in designing the new office or redesigning the current office. (The constitution of such a company committee will be discussed later in this chapter). This gives the entire working committee a chance to approve or disapprove the final departmental totals which have already been checked by the space planner with each department head. Thus, there is a final review by the company of the accuracy and reasonableness of each department's projected needs.

Once the committee has accepted the total space requirement figures for each department as shown on the survey of projected space, the planner, using the totals from the two departmental surveys, begins to prepare his master analysis form—"Summary of Space and Personnel." This form becomes his working tool in comparing present and projected organization needs in terms of total space and personnel. Major divisions on this form are "Present Location" and "Present and Projected Space Needs." Under Present Location, sub-columns are "Building" and "Floor." The next subcolumn is "Department." Under both "Present" and "Projected" columns, sub-columns are "Personnel" — with provision for entering number of men, number of women, total personnel, and "Total Assignable Area Square Feet."

The summary totals for each department's present and projected space requirements are now transferred, department by department, to the Present and Projected columns of the "Summary of Space and Personnel" form. Now, in summary form, the space administrator has a comparison of present and projected total space and personnel requirements for each department within the organization.

(To be Continued)

Preview of 1959 events—

(*From page* 160)

Sponsor: American Institute of Banking.
Place: Bellevue-Stratford and Sheraton Hotels.

IMS First National Meeting. Chicago, June 4-6.
Sponsor: Institute of Management Sciences.
Place: Congress Hotel.

National Business Conference. Boston, Mass., June 6.
Sponsor: Harvard Business School.
Place: Harvard Business School.

AMA Seminar: Effective Supervision of Office Personnel. New York, June 8-10.
Sponsor: American Management Association.
Place: Astor Hotel.

NPRA 1959 Meeting. New York, June 10-13.
Sponsor: Newspaper Personnel Relations Association.
Place: Savoy-Plaza Hotel.

NAPA Convention and Inform-A-Show. New York, June 14-17.
Sponsor: National Association of Purchasing Agents.
Place: Waldorf-Astoria Hotel.

NAA 40th International Accounting Conference. New York, June 21-24.
Sponsor: National Association of Accountants.
Place: Waldorf-Astoria Hotel.

AMA Seminar: Evaluation and Improvement of Message and Data Communications Systems. New York, June 22-24.
Sponsor: American Management Association.
Place: Astor Hotel.

NMAA 8th Annual National Conference and Business Show. St. Louis, June 24-26.
Sponsor: National Machine Accountants Association.
Place: Chase and Park Plaza Hotels.

IMS Sixth Annual International Meeting. Paris, France, First week in September (exact dates to be announced later).
Sponsor: Institute of Management Sciences.
Place: Conservatoire National des Arts et Metiers.

ISA 14th Annual Instrument-Automation Conference and Exhibit. Chicago, September 21-25.
Sponsor: Instrument Society of America.
Place: International Amphitheater.

LOMA 1959 Annual Conference. Chicago, September 28-30.
Sponsor: Life Office Management Association.
Place: Edgewater Beach Hotel.

ARMA Annual Meeting and Clinic. San Francisco, October (exact date to be announced later).
Sponsor: American Records Management Association.
Place: To be announced later.

NASS 17th Annual Convention. St. Louis, October 11-13.
Sponsor: National Association of Suggestion Systems.
Place: Sheraton Jefferson Hotel.

NIGP 14th Annual Conference and Products Exhibit. Cleveland, October 11-14.
Sponsor: National Institute of Governmental Purchasing, Inc.
Place: Cleveland Sheraton Hotel.

SPAA International Systems Meeting. Toronto, Ontario, October 12-14.
Sponsor: Systems and Procedures Association of America.
Place: Royal York Hotel.

AMA Office Management Conference. New York, October 21-23.
Sponsor: American Management Association.
Place: Roosevelt Hotel.

CIA Annual Conference. Pittsburgh, October 24-28.
Sponsor: Controllers Institute of America.
Place: Penn-Sheraton Hotel.

ABA 85th Annual Convention. Miami Beach, Fla., October 25-28.
Sponsor: American Bankers Association.
Place: To be announced.

Fifth International Automation Exposition. New York, November 16-20.
Sponsor: Richard Rimbach Associates, Inc.,
Place: New York Trade Show Building.

Automation—

(*From page* 144)

than its full range of abilities, is paying its way for the office that is employing it.

This is an example of mechanization at a point where a particularly heavy clerical load justifies substantial machine investment even for a small office. The systems revisions and overhaul that has been achieved during the recession period, rough and ready though it may be in terms of the extremely detailed systems redesign that must precede a centralized data processing operation, may make much more apparent to management and systems departments points at which complex machines, or even small computers, can be used.

Such mechanization at points of stress can serve a company well, can both speed its operations, and increase the tempo of the flow of operating information to management. Many companies need no more. With a well designed system, a small management group, and operating problems that do not demand consideration and evaluation of a great many variable factors, such a company can face the future secure in the knowledge that it has reached the plateau of automation suitable to its needs.

The second level of automation exists when one machine—the computer—in effect accepts the products of other machines, and not only processes those products into desired end results, but also makes operating decisions based on the streams of information being fed to it. It then feeds those decisions back to the company in an automatic control system. This is the level which demands the most expensive machinery, a large electronic data processor, with all its supporting and auxiliary equipment. It is also the level which is the most difficult to evaluate in terms of actual dollar savings. Moreover, it is the one with which management to date has had the least experience, and the one consequently which the management of companies that have not yet experimented with electronic data processing is apt to regard with most suspicion.

Tied in with this second level of automation is the potential of the electronic data processor to aid management in decision-making thorough

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use of operations research techniques. Some of these techniques, in a large company, may only be practicable if a large data processor is available.

One of the reasons such applications have been comparatively rare in the past has been the lead time needed to program a computer for a new situation. In many cases individual problems which could be solved by one of the mathematical techniques used in operations research simply were not practicable for computer application unless the machine had already been programmed to follow through the steps required in the particular technique. Programming the computer could very well take more time than the solution was worth, or alternatively could take so much time that the situation for which a solution was being sought would have ended before the solution was found.

New developments spur interest

But new developments in computer coding techniques, first reported in this magazine in October, promise a possible early solution to both the time lag involved in programming a problem for a computer, and the shortage of trained programmers for electronic data processing installations. Remington Rand announced this past year development of a pseudo code through which entire computer routines could be designated by one operating direction—a single English verb. The computer itself would then translate the single directing word into a whole routine of instructions to be followed. The computer thus can compile from simple directions a fairly complicated program, translating each word on the instructions typed on its input tape into a sub-routine of detailed directions. The total of sub-routines designated by the clear English operating directions created by the programmer encompasses the whole program a computer must follow in carrying out some fairly complicated routine.

Thus, the machine takes over part of its own coding—activated by a single word, it instructs itself to carry out a whole series of sequential operations with instructions as to which choice it shall make if alternative decisions are necessary anywhere in the sequence.

The next step envisaged by computer manufacturers (although Remington Rand was the first to announce development of a pseudo code, other manufacturers are working on similar coding simplification measures) is the development of true automatic programming. If this were achieved, the machine could be given a problem itself, rather than vastly simplified operating directions for solving a problem. It would go on to create its own complete program of operating instructions for solution of the problem.

Obviously such an accomplishment would make practicable for the first time individual solution of many mathematical problems presented to the machine, even if the machine had not previously been programmed to solve such problems. The machine would become a much more flexible working tool, in terms of operations research techniques, than it has been until this point, and would gain equal flexibility in terms of any other new routine it was required to carry through. As such, its usefulness to management in every situation — the exceptional and unanticipated as well as the routine—would become far greater than it is today even for companies that are using computers with imagination, with intelligence—and with profit.

Six challenges—

(*From page* 26)

rigid system of direction for all office workers. This, would in its turn, probably mean that the ratio of supervisors to workers would have to be increased anyway. Yet the group from which such supervisors would normally be drawn will be smaller than it was even in 1955.

Standards for appointment of supervisory workers may have to be compromised, so that older workers who have never shown enough ability to move out of the basic clerical class are appointed, or mediocre workers in the shrunken 25-34 group will have to be promoted. Probably, too, there will be increasing pressure within the office to break its resistance to hiring workers over 40, and less reluctance to put women in positions of authority over men.

3. Just as the basic clerical force is expected to expand, so too is the corps of executives in American business. And here, too, some sharp reassessments have been going on in recent years. More and more companies are finding that they have plenty of qualified specialists in the middle management ranks, but far too few men with broad enough educational background, outside their specialties, to move up to top executive status. This has led to some long second thoughts about the qualities that are really called for in a top executive, and how many of those qualities are really found by present executive recruitment techniques. The increasingly frequent "pirating" of executives of one company by a rival company, or sometimes even by a company in an entirely different field (a practice which has become so common that several quite prosperous consultants specialize in finding executives willing to be "pirated") seems to indicate that something has been wrong with the basic recruitment and selection techniques of too many companies.

Business schools questioned

The first signs of disillusionment with the graduate business schools, which have provided the elite corps of "future managers," are beginning to appear. Some recent articles have suggested that it might be very provocative to study the official level reached by a standard liberal arts college graduate who had entered a given company's employ, and the level reached by a business school graduate picked as a future executive, some twenty years after each has entered the company. It is the contention of at least some educators and business leaders that any thorough survey would indicate that a good liberal arts background may not earn the college graduate entrance on as high a level in the company structure as the business school graduate, but that his rate of progress in the company is usually just about equal, and that as both move on to the higher management levels, the man with the better general educational background begins to forge ahead of his business school competitor.

Whether this theory is sound or not, no one will know until such a survey has been taken over a wide cross section of American companies.

Whatever its validity, it is true that business schools today are beginning to stress their desire to get students with a sound liberal arts background in undergraduate school. And it is also true that more and more companies are attempting to give their promotable executives a better background in science, the arts, and literature by sending them off to cooperating col-

leges or universities that have set up special short programs of general education designed exclusively for businessmen.

In other words, all signs point to a strong possibility that past "scientific" methods of recruiting potential executives may have sought, if not the wrong abilities and backgrounds, at least too little of a mixture of different kinds of abilities and backgrounds; and that many company management development programs have not repaired this mistake well enough to produce a group ready and equipped to move up to top management positions. And obviously, with an expansion of executives needed all along the line, this is one weakness that requires immediate exploration and cure. This problem, too, will be made more acute by the relative scarcity of personnel in the 25-34 year age bracket.

Points 4 and 5 in our list of major personnel areas requiring study, which cover the changing age groups and work life duration of women—and possible changes in their executive status—are dealt with more extensively in the article appearing on page 30 and so will not be discussed at length here. Obviously, however, a continued increase in the number of married women over 35 in the office plus a sharp lessening of unmarried younger women will have a decided effect on the entire office personnel picture, and most standard personnel practices as we have known them in the past. By the same token, the almost imperative necessity—if the office continues its expansion—to assign women in this older age group to executive positions for which they are qualified will mean a reassessment of many of the standards, principles and prejudices which the office has applied, knowingly in some cases, unknowingly in others, through the years.

6. Unionization. This subject is also covered fairly extensively, in terms of union objectives and plans, in the article beginning on page 34 of this issue. It goes without saying that a concerted union drive to organize clerical workers would bring on a whole host of new personnel problems, regardless of whether or not the drive were successful. Organized labor has in the past made many statements about its determination to organize white collar groups; very little has come of it. But now the unions seem to be serious about their plans—for the very good

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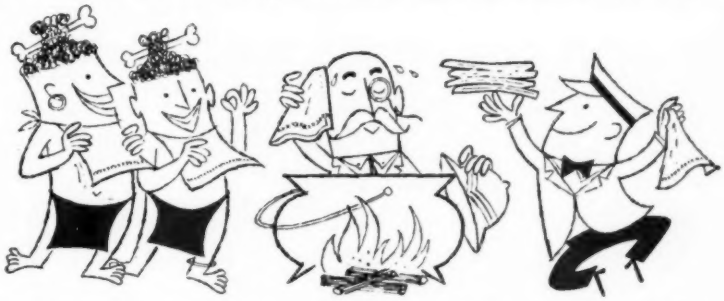

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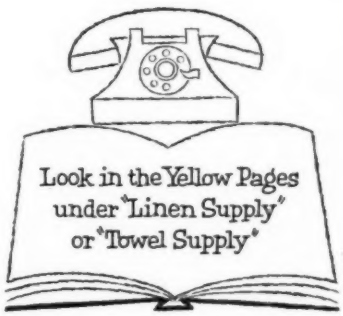

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reason that their own economists are warning them that they must recruit white collar workers if they are to maintain their economic and political power.

Perhaps the greatest obstacle to unionization of office workers in the past has been the "prestige" factor. Office workers do not have such apparent arbitrary limits set on their advancement as do factory workers. Presumably, there has always been at least a possibility for each of them to cross the line to "management." To the degree that this possibility remains real in the thinking of office workers, it can constitute a defense against successful union penetration of the office. But an office in which the hierarchy is obviously rigid could prove a productive field for union organizers.

The recession may be over, but the personnel picture isn't set for the next twenty years as a result. The office personnel function will be affected by some of the most profound social changes that have ever occurred in this country—affected by them, troubled by them and, possibly, made far more difficult by them.

But simply because these changes will have such a profound effect on the office, the personnel function and those who must administer it will face the most challenging, the most stimulating, and potentially, perhaps, the most important role that personnel administration has ever been called on to play. The office, in the last analysis, is people, and intelligent, perceptive personnel administration is the most important foundation for its success.

Installation—

(*From page* 19)

and it is often one of those that remains permanently hidden. An application carried on a computer that can be done more profitably and equally well by non-computer methods is costly in two respects. In the first place, it wastes an amount of money equivalent to the cost of the computer system over the conventional system. More important, it takes up time that could more profitably be used on other applications, or in preparing for other applications.

This situation is very common where there is excessive pressure to justify the computer on the basis of clerical cost offset. Initial applications are put on even though they are barely justified, or not justified at all, and the effort involved in preparing them for the computer diverts attention from the better applications. This is one of the fallacies of measuring efficiency of computer usage by the number of hours of operation. It may be easier to prepare a break even operation that takes two hours per day on the machine than it is to plan a really profitable one that takes only half an hour per day. And at the same time the break even preparations are taking up all the manpower and preventing any progress on the more desirable use of computer time. The only effective way to combat this tendency is to have a very strict system of standards for evaluating the worth of a computer application. And these standards must be accepted not only by the data processing people, but by top management as well.

4. *Too much—or too little—equipment.* The cost of too much equipment is obvious, although it is not always so easy to discover what represents too much equipment. Stand-by equipment in case of emergencies, excess capa-

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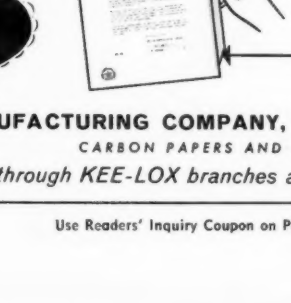

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city for peak loads and rush work, and provision for immediately planned expansion are all reasons that justify extra equipment to some extent. But even in such cases, there is danger that loose control will gradually build the excess into the day-to-day system, so that when the breakdown occurs or the rush work arises, even the extra equipment does not fulfill its avowed purposes.

Frequently, poor scheduling and bad planning can result in excessive equipment need. Before long, this will involve not only the rental costs, but also, extra personnel to operate the machines, and a normal increase in overhead. It is one of the hardest of the hidden costs to find.

Too little equipment can also be costly. Insufficient peripheral equipment may require extra computer time for certain operations. It may require more difficult programming and may even preclude the use of the data processing center for certain functions to which it could make a significant contribution. The problem is not too different from a production situation, except that there is much less experience available to serve as a basis for planning, and the costs of too little equipment are not always so obvious. The one consolation here is that sooner or later the manufacturer can be counted on to point out the need for more equipment.

Don't skimp on people

5. *Inexpensive people.* This is one of the costliest areas. It requires little elaboration, except to say that in the field of automatic data processing it is fairly difficult to find good people even if one is willing to pay well. Attempts to run a computer center with too few people, or with people who have had insufficient training or experience is probably the most expensive error that one can make, for it gives rise to a host of other costs.

This does not mean that running an installation with people selected from within the company and carefully trained is a bad policy. It does mean that they must be thoroughly trained, and once in the new jobs, they must be paid in accordance with the general rates for people of similar experience.

6. *Inadequate preparation.* Attempting to operate a computer center in a company which is not ready for it becomes extremely expensive. The same is true for any given application; it should not be placed on the computer until the groundwork has been thoroughly laid. It is hard to estimate the money wasted while a computer attempts to process data that has been badly prepared or which is incomplete. Inadequate preparation in a company for a computer application usually manifests itself either in poor input or in improper utilization of the output.

The problem of poor input requires careful planning in advance of the actual application of the computer to the work. Standardized systems must exist; accuracy must be checked; 100 per cent reporting must be assured, and the availability of all the required information must be arranged. Even after all this has been done, there will be difficulties enough in adapting the input to computer requirements.

Utilization of output is a completely different question. It is partly a function of good system design, but mostly a question of orientation. There is no sense in producing a report unless there is a good chance that eventually it will be utilized. This may require hard selling on the part of the com-

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puter people, or on the part of top management. However, just as in a production operation, it is wasteful to produce the work unless the market is there.

A good, hard look at computer operations may be instrumental in recognizing some of these costs that are obvious enough when written out, but which remain hidden in many actual installations. And the result of such an examination may be significant savings. But the long run solution is not to be found in an ad hoc approach. For the long run, computer operations, and the activities related to computer operation, require the development of performance standards, quality standards, and a carefully planned system for assuring adherence to these standards.

Standards should be developed for programming and system design time, for set up time, for evaluation of computer applications, for computer running time, debugging time, and all the other factors that make up the operations of a computer center. These standards are by no means impossible to prepare, as has often been claimed, and they are essential to efficient computer operations.

Carborundum—

(*From Page* 22)

be analyzed, and superfluous information eliminated.

Figure 2 illustrates how the path of information was charted by Carborundum planners. Two types of master data are illustrated on the chart: customer information, the "A" file, and product information, the "B" file. At points on the chart where categories of information from either of these master groups are required, the chart is keyed according to the file segment number.

Now, tracing the customer order through the cycle, the Distribution function, activated by the order, requires first of all a check against inventory information. Depending on the status of inventory, either a shipping order or a manufacturing order results from the customer order. In either event, the same static information is required to carry out the first step in the cycle; segment A-1 from the master customer records, and segment B-1 from the Master product records.

If the inventory check has resulted in a manufacturing order rather than a shipment from inventory, new documents are now created within the Manufacturing function. The order is scheduled into production, and material requirements to fulfill it are determined. Segments A-2 and B-2 of the master file information are required to carry out these requirements. The records created in the process of manufacture in turn generate payroll records, cost accounting information, and production control data. Data from these production records flows into Administration where, in combination with segment B-3 from the master records—Unit Standard Costs—it is used for production accounting.

Data flows to Administration

Shipping orders created in either the Distribution or the Manufacturing function also flow into Administration where, in combination with information from master file segments A-3 and B-4, they generate invoices. Invoice information in turn flows into Sales Accounting, Accounts Receivable, and Market Analysis. To create records in these areas, information from File Segments A-4 and B-5 is added to the basic invoice information.

And as the final step in the paperwork process, sales accounting information—receipts—is combined with production accounting and other accounting data—costs—to produce the profit and loss statement.

What does this sequence mean in terms of mechanization?

According to Carborundum planners, there are two significant points in the sequence charted as far as mechanization is concerned.

At each step in the sequence, information is added to the incoming information, and as a result of the new "total" of information, one of several alternative courses of action is chosen. The basic step in data processing, then, is addition of new information to incoming information, and a resultant action based on the information total.

The new information added at each step must be inserted into the work process by human workers, unless it can be "stored" within the equipment being used to perform the step.

Second, if mechanization is to be instituted into the system the closer it comes to the basic input information, the less human effort will be needed to feed information into the mechanized processing sequence. Each step in the sequence adds new information to the basic information which starts this cycle; the farther along the line mechanization begins, the more information will have to be manually entered.

Charts of this type were prepared in explicit detail at Carborundum for each major paperwork area, and then the planner examined each area in terms of these questions:

1. Would it be of value to get more information from this operation or document?

2. Would it be of value to increase speed of accomplishment?

3. Is accuracy a major problem?

4. Are the operations performed of the sort that lend themselves to electronic data processing techniques? Or, in other words, can decisions be made according to fixed set of rules, and is data rearranged in logical and consistent patterns?

5. Is the amount of input data such that it can be economically recorded?

6. Finally, does the operation at present call for so many man hours that real dollar savings can result from mechanization?

The study group found that the answer to most questions for most of the Carborundum paperwork areas charted was Yes.

The answer was clear, Carborundum felt; the company began working on an electronic system designed to cover the paperwork sequence from the customer order to, ultimately, the preparation of the annual report. In designing the system, the Carborundum planners followed a set of fundamental "Rules of Mechanization."

1. All input information which is invariant, or almost invariant over a long period of time, should be correctly translated into machine language once, and only once, and filed in a convenient and accessible manner.

2. All input variable information should be captured, translated into machine language, and verified at its origin.

3. All communications of information in the system should be in machine language.

4. All operations on the information in the system should be by machine except where non-routine decisions are required.

5. A minimum number of translations of the information should be made.

Following these rules the study

group and its associated electronics committee worked out a basic system under which all major paperwork areas would be mechanized, prepared procedures manuals, and investigated and chose the mechanical components of the system. The paperwork flow designed is illustrated in Figure 3.

Following the principle that all operations begin with the sales order, and that mechanization should begin as early as possible, the sequence developed by the planners starts in Carborundum's twelve district offices. When a customer order is received at any district office the processing cycle begins.

A clerk in the district office, using a Friden Flexowriter which employs pre-punched customer and product tapes to enter static information, prepares the basic sales order for district office processing. The "information total"—order information and static information taken from the pre-punched tapes—is also recorded simultaneously by the Flexowriter on a punched tape. The information recorded on this tape is then transmitted by Teletypewriter over leased lines to the company's Communications Center at Niagara Falls, where receiving teletype equipment produces a duplicate of the sending tape.

The incoming paper tapes are fed into a Paper-Tape-to-Magnetic-Tape converter which translates the order information to magnetic tape for computer processing on the company's Univac.

Four basic record files are stored in the Univac's system: Master Customer File, Master Product File, Finished Goods Inventory, and Orders-in-Process. As each day's orders are processed through the Univac, the necessary static data for each transaction is selected automatically from the master files, the inventory is updated and searched, for items not stocked at the district office where the order originated, and finally the order information itself is stored in the Orders-in-Process file.

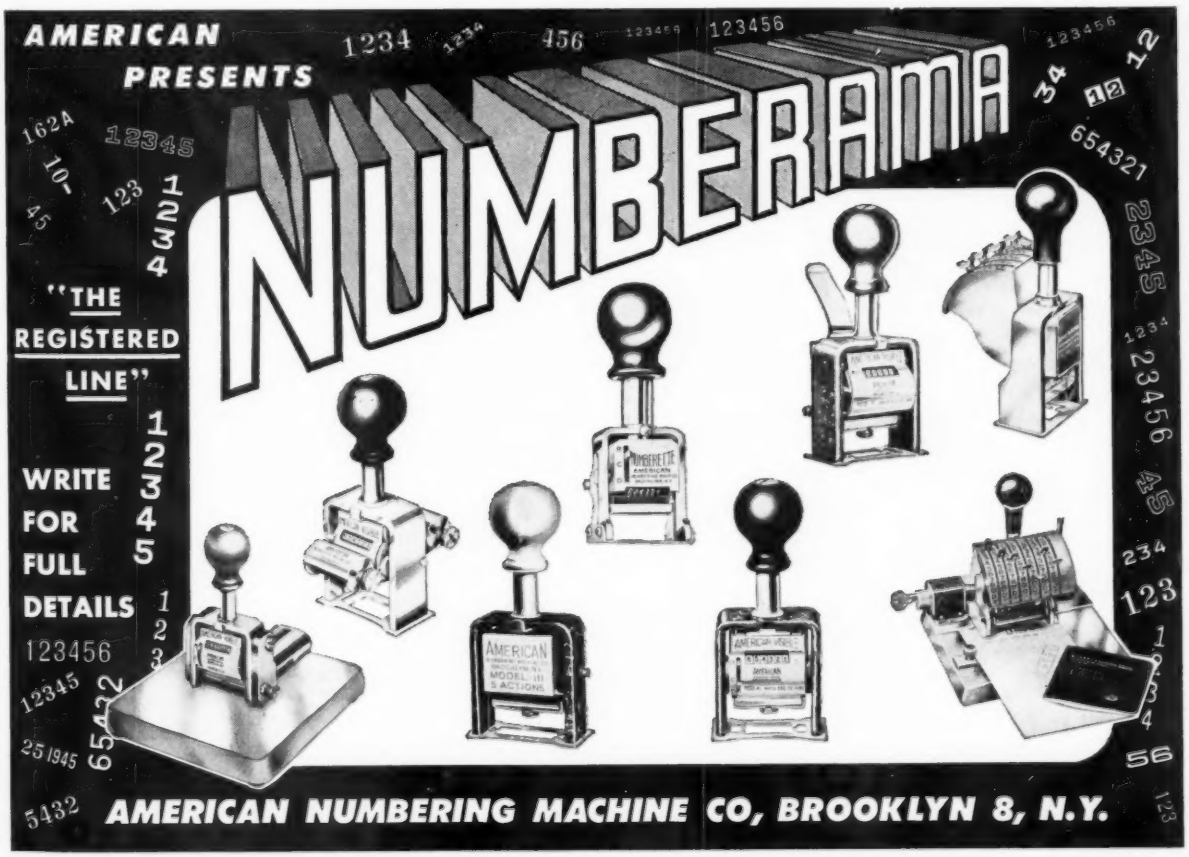
Univac decides ship or make

If the Univac inventory search indicates that the order can be supplied from some other stock location, the machine automatically produces a shipping order tape for its printing unit. If the computer determines that the order will have to be made up, manufacturing orders are similarly produced.

The machine also produces an Order Action Advice Tape, which is converted on the Magnetic-Tape-to-Paper-Tape converter into punched paper tape. This paper tape is used to transmit the information over the leased wire circuit to the district office where the order originated. There the receiving teletypewriter produces a legible copy of the information in the form of an Order Action Advice Message.

As either warehouse or plant fills an order and ships it, the shipping information is recorded on a Flexowriter just as order information is, and fed back over the leased wires to Niagara. There the punched paper tape created is converted into magnetic tape, and the shipping information is fed into the Univac. Notice of shipment of any order automatically clears the Orders-in-Process file, and also causes the computer to produce an invoice tape, which then is put on the high speed printer to print invoices.

In the processing cycle, the computer records on magnetic tape necessary data for sales and inventory records and



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analyses. These tapes are processed periodically to prepare legible copies of the needed reports.

Thus, two of the five types of basic source data identified by the Carborundum planners, and all the documents which stem from them are handled entirely automatically throughout the entire processing cycle—the basic sales order, and the Master Information Records affecting any step in the sales order processing sequence.

But another of the basic data sources has also been mechanized at Carborundum. The company has adapted its payroll procedures to the electronic data processing system. Payroll source records are recorded on magnetic tape by direct entry on a Unityper. This fresh information, when fed into the computer, is processed against the master payroll records to produce tapes, which in turn print payroll checks and payroll analyses on the high speed printer.

This is the stage Carborundum has reached now—almost complete mechanization of two of its major clerical processing sequences. It is, in addition, taking on some of the major "action and reaction" sequences within the company. For instance, when a particular order is received, the Univac may find that it can be filled from inventory. Simultaneously, when stock of the particular item ordered approaches a minimum limit, the computer produces manufacturing orders designed to bring inventory up to the desired level. The same type of "feedback" will soon be used in plant loading and scheduling.

So far, the order processing sequence exists only for the three manufacturing divisions of the company in the Niagara Falls area, but these divisions account for 65 per cent of the company's sales, so the reduction in clerical work has been substantial. To date, too, the papers and records created within the Manufacturing function are still being handled by conventional methods within the division concerned, but it is planned to meet many of these requirements in the future through electronic data processing, so that manufacturing orders created by the computer will also incorporate raw material requirements and mix quantities.

Carborundum has not yet really begun work on its second major objective: production of better management control information. But it does feel that its mechanization of routine functions has now progressed to the point where it can begin work on the second objective while continuing to develop its applications of the first, and extend automatic processing into the areas where it has not yet been introduced—such as the addition of necessary factory operating information to the manufacturing order for use within the plant.

Coding problems immense

Naturally, the Carborundum systems revisions required an immense coding and classification operation for the various types of information needed within the system. Carborundum attacked this problem by dividing the whole field of information required in the system into three elements, and posing pertinent questions as far as each of the elements was concerned.

The elements as Carborundum defined them, and the questions to be answered—

1. Source of Data.
   a. Is the data to originate on source documents such as an incoming customer order, and, if so, will it be reduced to codes or written in the clear?
   b. Is the data to be obtained from master files on command from a source document code?
2. Standardization of data.
   a. What is the digit limitation to be for source document and master file data?
   b. What is to be the disposition of existing codes?
   c. Are new codes required?
3. Application of data.
   a. Which of the aforementioned is required for input/output media—paper forms, paper tapes, magnetic tapes, cards, etc?

Preliminary step was to segregate basic data and product data, and then place in one or the other group all data in use in the current system. All information on customer orders, plant documents, invoice copies, and existing records and reports were collected and classified within these two categories.

After checks had been made with sales and plant personnel to insure that all necessary data under the existing manual system had been listed and categorized, each item listed was subjected to the following questions:

1. Can the data be standardized?
2. Is it always alph[illegible] numeric or a combination of [illegible]
3. Can a fixed number of digits be established per datum?
   a. If not what should the maximum digit limitation be?

As these questions too were resolved in cooperation with plant and sales personnel, all basic "pieces" of information needed for the new system were classified as shown in Figure 3. "Fixed" for a particular bit of information indicates that it will always be designated by a given number of digits. "V" or "variable" in the code shows that the data will have a varying number of digits (customer's name for instance), but cannot exceed the digit limitation posted in the right hand column. The middle column indicates whether the data can be expressed wholly in numeric form, in alphabetic form, or whether it requires a combination of both.

Now, each bit of data listed had to be analyzed in terms of input and output requirements—in many ways the most difficult part of the coding assignment, according to the Carborundum planners.

Finally, each bit of data listed was categorized in terms of its place in the total mechanized processing system being evolved. Which data should go into the master file? Was data to be entered on the master file needed for subsidiary purposes elsewhere? What media should be used for recording each bit of data?

Final resolution of the questions for just four bits of information: customer account number, salesman's name, product number, and selling price, is illustrated in Figure 4. The X's on the chart indicate that the particular piece of information is needed for the document or record listed at the left. The A, P, and M symbols are explained on the chart. For example, a customer's account number must be recorded on the district office card record of the individual customer; on the master paper tape used in the district office to complete the sales order tape for transmission to Niagara Falls; and on the master magnetic tape at the computer center. The symbol "A" indicates that the account number will be recorded manually on the District Order Abstract, by a reference to the District's Card records. "P" shows that the account number will be entered

the district master sales order is prepared on writer in the district office. After t a from the master paper tape, along with all other data on the particular order, has been transmitted to Niagara Falls, and there converted into magnetic tape for computer input, all subsequent forms and tapes will receive this information from the master magnetic tape.

Detailed planning pays

The immense amount of work involved in classifying each bit of data for the system in this way before the mechanization plan could go into operation is emphasized by the fact that the final master chart recording each piece of information and its place in the system is thirteen feet long. The Procedures Manual, based on the standards finally recorded on the master chart, is 330 pages long.

But all the work and all the detail are paying off, Carborundum reports. The thorough coding of all data needed in the system was so effective that not one digit of the coding plan has had to be changed since the system went into operation. The system is now operating at a break even point, and the company believes that it will recover its initial installation expenses within five to seven years. Total sales figures for the preceding day are now available at 9:00 A.M. each morning, in contrast to a time lag of up to two weeks under the old system. Eventual goal, which the company expects to achieve by 1965, is to have every piece of information needed for the company's annual report to stockholders in the president's office during the first week in January. The company expects to have all its divisions tied into the data processing system, rather than just the major divisions in the Niagara Falls area, sometime between 1963 and 1965.

What is the effect of institution of such a system, not just at the central point, but out in the field? A few of the points to be considered, from the field point of view, were expressed by Thomas V. Welch, manager, Manufacturing Coated Abrasives Division, The Carborundum Company, in a recent speech before the American Management Association.

"1. It is important to educate as many key people as possible in the operation and capabilities of the computer system—divisional people must know something of the capabilities of a large scale computer system in order to take advantage of the new approaches which the total systems concept make possible.

"2. However, you must dispel the belief that the computer is a magic box which will produce all kinds of information and reports by simply waving a sheaf of papers over it.

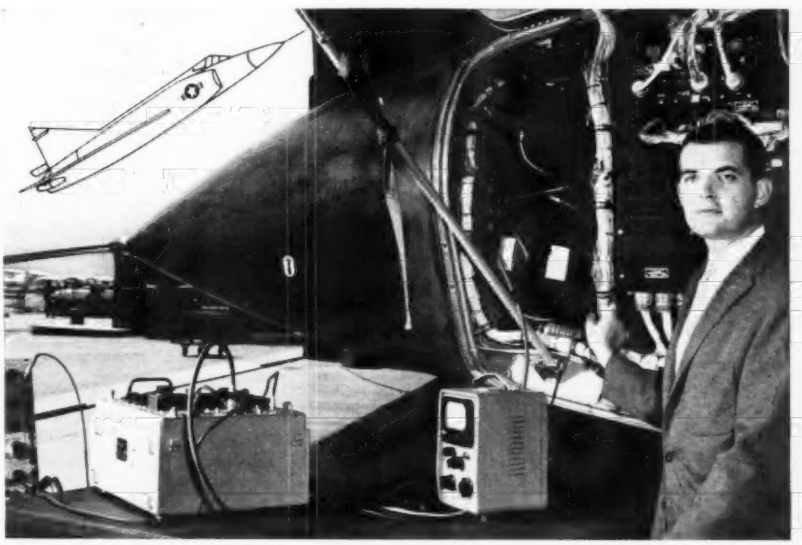
"3. You must get your divisional personnel to realize that everything they ask for they must pay for since the central computer has no visible means of support except the divisions who get the service it provides.

"4. Divisional people have a hard time realizing that their problems are not unique and that their requirements are only part of an integrated procedure encompassing the whole company—recognition of the 'total systems' concept by the lowliest file department supervisor is a necessity.

"5. Once acceptance is obtained you must give the central computer people all the help they require at the divisional level—remember that they only know in a general way what you need—you must fill in the details or you won't get what you should have to take full advantage of what the computer can do for you.

"6. Setting up master files is a costly job so they should be carefully planned before starting and precisely maintained after they have been set up — methods of up-dating must be economical and easily accomplished.

"7. Once master files are set up and properly maintained, checks must be



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made to stop the checking by order censors, price clerks and others—you must instill confidence in master files.

"8. Once the computer is in operation you must check and recheck to make sure that all phases of the division are taking advantage of what the computer is doing for you—also since the computer has a large amount of your data on file, you should get the management controls out of this data which you never could get before.

"9. Don't baby the computer or its operating personnel—make your requirements that you are prepared to pay for felt strongly—if you really need and want something, don't give up on it—the computer can do most anything, but remember it all costs money and you are the one who will pay for it.

"10. Since the 'total systems' approach causes such broad changes in ways of doing things it is easy to be critical of these changes. However, if you keep your criticisms in a constructive vein the data processing people will listen to you and they will follow your suggestions if they are practical and possible of accomplishment.

"11. The 'total systems' impact on a division's operations is a severe shock and must be handled with careful attention to communications all along the line from top division management down to the lowest file clerk.

"12. Finally, the 'total systems' concept, although difficult to adapt to a multi-divisional company like Carborundum, has so many advantages which lead to increased business and increased profits for us at the divisional level and for the entire company that it is well worth the effort which has been expended to date. We recognize that we have only started to develop the concept. We expect bigger things from this concept than are in sight now. We, in the Coated Abrasives Division, look forward to accomplishing these things and we are sure that it will be worth every minute of it."

Womanpower—

(*From Page 32*)

Howard S. Kaltenborn, vice-president, Industrial Relations Counselors, Inc., New York, reports that offices show even more reluctance to hire older women than industry, sales and professional organizations, and service groups, in spite of the fact that many of the stated objections to hiring women over 40 would have, even if they were based on facts rather than fancies, far less application in the office than they would in industry or some of the service functions. Physical strength is not a prime requisite in office work, nor is mechanical ability, but Kaltenborn cites as the reasons most frequently given for not hiring mature women:

"Women have less physical strength and stamina than men, and older women less than younger women.

"Older women are slower, and consequently make less productive workers than younger women.

"Women are absent from work more often than men, and older women more often than younger women.

"Turnover is higher among women than men, and higher among older than younger women.

"Women have less mechanical ability than men.

"Women are emotionally more unstable than men, and older women are more unstable than younger women."

"Older women are more inflexible and set in their ways than younger women.

"Employing older women greatly increases the cost of financing employee pension plans.

"Most of these alleged liabilities of older women workers are based on hearsay and uninformed opinion, or at best, on isolated examples," Kaltenborn reports. "There has been very little systematic study of experience with older women in actual work situations, or their qualifications vis-a-vis those of younger women, and consequently little dependable factual information is to be had on the subject. The few limited studies that have been made indicate that some of the most widely held of these employer beliefs are erroneous."

For example, he continues, United States Bureau of Labor Statistics studies of production workers in two industries, household furniture and men's footwear, found that:

There was no significant difference in job performance between older women and younger women, or between older men and younger men.

There was no difference in productivity between women under 35 and women in the 35-54 age bracket. There was a 4 per cent drop in productivity for women between 55 and 64 in the

shoe plants; a 12 per cent drop in productivity for this age group in the furniture plants.

There was no evidence of a tendency toward higher absenteeism among older women as against younger women.

Workers in the 35-64 age group, both men and women, had a better record as far as continuity of service was concerned than workers between 25 and 34, while workers under 25 had the highest turnover rate of all.

Pointing out that there will be a much larger potential addition to the labor force in the next two decades from women past 35 than from any other age group (as a matter of fact the number of workers in the 25-34 age group, male and female, will actually be much smaller in 1965 than it was in 1955), Kaltenborn says of the office:

"Despite the fact that relatively few older women are employed in offices at the present time, there are many opportunities to utilize them in office occupations. These possibilities stem mainly from the fact that many older women now actually or potentially in the labor market were stenographers, secretaries, bookkeepers, or other types of skilled office workers prior to marriage. Many of them have been out of the labor market for a comparatively long period – usually from marriage until their children have entered high school or later. However, most of them still retain the basic elements of their skills, although frequently these skills may have become rusty from long disuse.

"A number of companies have adopted the practice of employing such ex-clerical workers and, after giving them refresher training, reassigning them to their former occupations. A few companies have even hired older women with no former experience and, with considerable success, trained them for skilled office jobs."

Part-time work is another extremely promising field which the office is not exploiting nearly as thoroughly as it might, Kaltenborn asserts. As evidence that such schedules could be worked out effectively, he cites the experience of "one of the country's largest banks" which for several years has had a program of part-time employment with flexible schedules, providing four regular part-time shifts five days a week. The bank also has evolved a highly successful training program aimed directly at such part-time workers, and, according to Kaltenborn, is entirely satisfied with the whole arrangement.

Such programs, if adopted more widely, would bring many benefits, he points out. Women in the 20-35 age bracket would not be forced completely out of the labor market. Thus, personnel shortages would be eased in a time of expanding employment, since even women with relatively young children and without household help can give some time to a job as soon as the last child has entered school. "It would also help assure their eventual return to the former employer on a full-time basis," Kaltenborn declares, "and it would help maintain their skills during the period in which it is necessary for them to be at home. It would appear to be especially worth considering as a means of holding on to highly competent women in professional and managerial capacities."

And use of women in such capacities will increase, as a matter of necessity if not choice, the conference report declares. It points out that women will have to be accepted in roles that traditionally have been "men's work" if the available labor supply is to meet the demands of an expanding economy. It states, too, that progressive companies will have to remove the invisible barriers that so often prevent women from moving up to supervisory or executive status, if they are to staff their management with the best people available.

Management adjustments required

Management will have a great many adjustments, and sometimes quite fundamental ones, to make in its entire personnel philosophy, according to this report. The custom of keeping "in-company" training programs for women workers short, and devoted only to indoctrinating feminine employees in the basic skills necessary to carry out low-level, dead end jobs, is sharply criticized, as is business reluctance to give women supervisory positions because "women, as well as men, generally prefer male supervisors." Actually, industrial and merchandising organizations have been using women supervisors successfully for years, as has the telephone company, conference participants point out. In-company training for advancement should be decided on the basis of the individual woman worker's aptitudes, interests, and abilities, they advise, and in the case of women over 35 with prospects of a long period of service with the

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company, there should be no automatic bar to such training if the woman worker has the same ability and intelligence as men admitted to the training program.

And beyond business' "in-company" training programs, much more emphasis should be placed on advanced education for all women with the requisite abilities, conference participants recommend. They note that 40 per cent of the highest intelligence group among high school graduates never go on to college, but that women are the worst casualties within this group — two-thirds of the lost 40 per cent are girls. They note, too, that the number of women taking graduate work in universities was lower in the middle fifties than it had been in any era since 1900.

Adult education urged

Both of these national losses stem from a lack of realization, among girls of school age and the public at large, that so large a part of the average woman's life — the largest single portion of it—will be spent at work, the report indicates. Presumably, if this were more thoroughly understood, a large number of women capable of benefiting from education at the college and university level would go on beyond high school. Of course, the extremely early marriage age that exists today acts to prevent many women from completing—or even beginning—their college education, just as it shortens their first period at work.

Conference participants recommend further exploration and development of community colleges, which could offer advanced educational facilities to women on schedules that could be adapted to their homemaking activities during the fifteen-year span when they are primarily concerned with those activities. They recommend, too, further investigation into the possibilities of educational television and, as important as anything else, much better guidance and short-term training facilities geared to the adult women of 35 or older preparing to re-enter the labor market. A few individual private groups in different cities have created such programs, but they are still few and far between, the report states. Here, conference participants urge, is an area where much closer cooperation and joint planning efforts between leading employers and the local public school systems might produce excellent results.

Major findings of the conference on "Work in the Lives of Married Women" include:

The new pattern of work outside the home for wives and mothers has had, by and large, desirable social and economic consequences.

There is no single problem which can be identified as "the problem" of the working mother or wife.

Expected continuation of high levels of employment and high demands for labor, will inevitably lead to a continuation of recent trends in women's employment.

In other words, whether business likes it or not, approves of it or not, it is, if the economy continues to expand, going to have to depend more and more on women as active participants at every level of its structure, even though the great majority of those women are also carrying woman's traditional responsibilities: children and a home.

P.C.C.—

(*From page* 40)

the organization is such that the basic concepts necessary to insure a successful PCC program will be accepted by all levels of management. While immediate and categorical acceptance of a PCC program is not to be expected—such acceptance being part of a long-term educational process— it is useless to expect success for such a motivational program if top management itself is not

1) willing to apply the same yardstick to its own efforts,

2) willing to expend the effort necessary to insure its success at all levels,

3) prepared to adopt the psychology that its lower level managers are selling a skill to the company at a price which can be objectively determined,

4) willing to share with lower level management savings which are the responsibility of lower level management, resulting from a differential between the selling price of an administrative service and the cost of performing that service.

PCC is not a program of coercion. It is a program of cooperative effort and determination of fair standards of work among (not between) top and lower management levels. In many cases where top management and lower level management have both been asked

to estimate how much a particular administrative operation should cost, estimates made by managers directly supervising the work have been much lower than estimates made by top management.

Essentially, what is called for here is a true cooperative attitude and mutual trust among all levels of management. This is vital to the success of a motivational program which rests on the "every man in business for himself" principle.

While top management may not accept this principle of its own volition, we believe that the future will force acceptance of the principle upon top management.

The United Auto Workers' demand for profit-sharing is an example of a distortion of this principle which management may be forced to accept, unless it adopts of its own free will a true measurement of the individual value to a business as expressed in a proper motivational approach.

The large labor unions realize the value of profit-sharing as a motivational factor for their members. The large unions also realize that in acting as collective bargaining agents for their members, they are in effect determining the price at which the services of their members will be sold, not only to a single company, but in many instances to an entire industry. The unions' bargining power on behalf of their members is backed by the ability to strike; in other words, to withhold services until an acceptable price has been negotiated.

While we do not believe that in the immediate future management personnel will be organized into unions, we have been experiencing some of the effects of the withholding of abilities on the part of management personnel because of the way they were compensated for their services. This is particularly true in the administrative areas of many companies, because of the nature of

1) the work performed,

2) the methods of compensation,

3) the lack of effective measuring tools so that individuals can be rewarded in direct relation to the value of the work performed.

How does a manager withhold some of his abilities? Look at your own company. What is your supervisory-employee ratio today compared with what it was ten or twenty years ago? With all the modern tools at your disposal to perform administrative work, has the real output of each employee and each manager increased or declined? Do your managers and supervisors, especially at the lowest level — those closest to the employees — consider themselves part of management, part of labor, or in a sort of nebulous world in which they are neither management nor labor? At some point in time, varying with each company, these lower level managers will make a decision. Whom will they join?

"Management" desirable choice

Every company obviously wants them to choose management. Then top company management must make the first move toward making these supervisors feel like management, act like management, and be management.

The first step toward this goal is a proper plan to insure the desired result.

Once top management has accepted the basic premises which will enable a PCC program to operate, it is time to consider just what type of program should be put into effect. While the principles of PCC apply to all businesses, just as good accounting principles do, the particular application of PCC will vary with the type, size, flexibility and nature of each business.

PCC is not a cure-all prescription, nor a formula to be copied from a book. It is a carefully designed and engineered plan, tailored to fit each company's individual requirements to produce the best results for that particular company.

PCC goes beyond accounting techniques. It includes within its scope not only the end results of a P & L statement for each "profit center," and therefore motivation for the individual manager and supervisor, but all of the techniques which complement each other and together result in an effective and profitable organization.

These techniques can be grouped into four major categories:

1) general management,

2) office management and procedures,

3) planning, reporting and control,

4) personnel administration.

Under each of these general headings are the particular techniques which should be used in the successful planning and installation of a PCC program.

1) Under general management techniques we would include:

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a) executive appraisal, compensation and incentives,
b) company-wide organization,
c) clarification of authority,
d) definition of functions,
e) distribution of responsibilities,
f) budgetary controls
g) elimination of overlapping and duplication,
h) cost, expense, sales, production and other performance controls.

2) Under office management techniques we would include:

a) systems and procedures,
b) office layout and space utilization,
c) organization of office services,
d) design and control of forms,
e) mechanization of office operations,
f) record analysis and retention,
g) design and installation of integrated data processing.

3) Under planning, reporting and control techniques we would include:

a) production planning and scheduling,
b) organization of production operations,
c) production control,
d) inventory control,
e) routing and dispatching,
f) production standards,
g) materials handling,
h) cost control,
i) employee incentives,
j) quality control,
k) purchasing, receiving and stores keeping,
l) maintenance control,
m) plant location and plant layout.

4) Under personnel administration techniques we would include:

a) organization of the personnel department,
b) wage and salary administration,
c) recruiting and selection techniques,
d) profit-sharing and retirement plans,
e) merit rating plans,
f) employee benefits,
g) training programs,
h) labor relations,
i) job evaluation,
j) executive development programs.

We are considering all of these as part of our techniques of administration because all of them influence the way we perform our administration functions in our company, and in turn the administrative function strongly influences our sales and production functions. Since the administrative function is essentially a service function, the services it sells (i.e., provides) for the sales and production functions are governed by the way in which the administrative area performs its work.

While not all businesses have formalized all of the techniques which we have listed above, every business, no matter how small, utilizes these techniques. For example, even a one-man business with a part-time secretary utilizes the techniques of job evaluation and wage and salary administration, as well as merit rating, to determine fair standards of pay and working conditions for the part-time secretary. The owner, however informally, must establish some sort of mental wage range for the position in comparison to other businesses and his own requirements; he must explain the duties of the job to the part-time secretary, and he must rate the girl

Customer Accounting Center

Supervisor: John Robbins — Week Ending January 8, 19..

Value Produced

Item	Quantity Processed	Value Per Item	Total Value
Orders	8,500	$ .12	$1,020.00
Invoices	11,000	.11	1,210.00
Postings	4,300	.07	301.00
Statements	2,100	.04	84.00
Collection Efforts	350	.31	108.50
Correspondence	600	.53	318.00
			$3,041.50

Actual Costs

Payroll	$1,653.00
Fringe Benefits	183.60
Space	110.00
Supplies & Forms	352.75
Miscellaneous	232.25
	$2,531.60

Gross Operating Profit (or Loss) $549.90

Quality Performance Index* = 50% (See Fig. 2)

Net Operating Profit (or Loss)
(Gross Oper. Prof. X Qual. Perf. Index) = $274.95

* 100 = Perfect Performance

Figure 1. Typical work center profit and loss statement

Quality Performance Index

Employee Clock #	Name	Lot Size	Sample Size	# of Errors	Error %	Weighted Quality Index
317	J. Edgar	1,435	150	0	00.0	100
319	N. Clavin	933	100	2	02.0	0
334	B. Good	2,132	200	1	00.5	75

Figure 2. Typical quality control report

on her performance in order to determine if the girl merits an increase.

As organizations become larger and more complex, the need becomes greater for removing these techniques from purely quick and haphazard mental reviews, and formalizing them with written standards to guide management personnel in their use.

Before we can begin to evaluate a manager at any level on his performance, we must set standards which we refer to as "prices" on the services of his area, which we shall call "profit center." Before prices are set for a profit center, we must determine the following facts:

1) Is the service (all or part) essential for the company?

2) Is the service being performed in the best possible manner, both for the company as a whole and the individual profit center concerned?

3) Does the profit center have the best tools for the job, including personnel, space, equipment, forms, and all the other items which will be needed for properly performed services? (We would not price a product our company sells on the open competitive market based on inefficient factor costs.)

4) Over what factors does the profit center manager have control, and what factors are beyond his scope of authority?

5) How effective is the profit center in its present performance?

In order to see how a PCC plan works, let us look at a hypothetical example based on a composite of several actual case histories. In order to understand more clearly the application of PCC to an actual business situation, let us take only one profit center out of the many in an organization's administrative function which would be affected by the program. It would include the operations we normally associate with order entry, billing, accounts receivable, credits and collections.

You will notice that we have rearranged our normal office operating departments in the profit center, which we have called Customer Accounting. In many companies the handling of orders and the billing of these orders would be a separate function from the accounting and collecting of open items. Because we have arranged our system along functional rather than departmental lines, to reflect the profit or loss entailed in an operation, we have gathered together all of the functions associated with completely processing and collecting from an account.

Our next job would be to apply standards in terms of monetary value, that is prices, for each function, and then for our profit center as a whole.

The profit center — Customer Accounting — is, in the profit-cost concept, a service company selling its product to the rest of the organization. Its products in this case can be expressed in terms of:

1. Orders handled
2. Number of invoices
3. Number of postings
4. Number of statements
5. Number of collection efforts
6. Pieces of credit correspondence

We have limited the number of products to be sold by this profit center to the remainder of the company in order to simplify the hypothetical case study. In actuality we find, as in any other company producing a complex series of items, that in most situations we would want to increase the number of categories or products for which the customer accounting center would charge. These might include such indirect items as customer inquiries handled, 'phone calls per day, number of items per order, etc. We could make our "billing" for our customer accounting center as complex as the situation requires and as our budget for computing the products sold allows.

Once we have determined standard times versus standard volumes at various volume levels, our next job is to price these hours in order to arrive at a satisfactory budget figure at whatever level the company may be operating. We may note that the most important part of profit cost control is centered on the techniques used to establish these prices for services. They must be of such a nature that management is willing to accept them as being fair expressions of efficient work, and they must also win the approval of the supervisors at all levels or we will find that the incentive which profit cost control provides has lost its effect.

Once the standards have been set, we can then price the various services and items produced by customer accounting. If we find that an individual clerk can bill twenty-five invoices an hour, we must then compute the wage scales and therefore the hourly cost for these twenty-five invoices; we must also add in overhead factors such as supervision, rent, equipment rental, and so forth, keeping careful and accurate histories to assure that our standards are not being modified by circumstances of which we are not aware, and that they will continue to be as fair as when they were originally established. We are thus able to determine a value for each salable item which our customer accounting center produces.

By simple mathematical calculations we can then determine the value of the total work produced by the customer accounting center. We would multiply the volume of each item produced by its value, and arrive at a total sales figure for the customer accounting center. We would subtract from the sales of the customer accounting center its actual operating cost, including all allocations of overhead and indirect charges.

The net result would be a profit and loss statement in miniature for the customer accounting center. This statement will allow both top management, and even more important, lower level supervision itself, to rate its effectiveness to the company as a whole. In order to maintain our incentive pattern, it should be expected that at least part of the savings achieved would be repaid to both supervision and direct personnel, so that further efforts toward reducing costs or increasing sales volume would continue in the future.

As in any company, however, it is not enough to show a differential between total sales and total costs. Its customers must be satisfied or any initial gains made would be lost, since sales volume would drop if the customers were not completely contented. The normal company, considered as a whole, knows how satisfied its customers are from increasing sales volume, from complaints, and from returns of merchandise. A method for the control of quality of work performed by any internal segment of the company must be substituted for

outside customer approval which rates the company as a whole.

In order to successfully ascertain the true gain or loss from the operation, quality control of one kind or another must be superimposed on paper work and other types of overhead operations. The quality control may take the form of scientifically designed test samples of work. Alternately, it may take the form of rating charts based upon supervisors' opinion in a very small organization, rather than a formal method of rating for quality.

Ratings for cooperation with the rest of the company, and for true fulfillment of its service functions must be made, or we will find that our profit center, while showing excellent gains for itself, will do harm, and result in a net loss for the other operations.

Samples of typical profit P&L statements, and typical quality control reports, are shown in Figures 1 and 2.

The most important step in the entire profit cost control installation program is the conviction on the part of all management levels that they are sharing in the proceeds of what is, in effect, their own individual business. Activating the program calls for the highest levels of persuasion and education. If the program is to operate effectively, the atmosphere must be one of mutual trust.

Agreement on standards vital

While any and all suggestions and criticisms must be heard before values are assigned (it is important that all levels of personnel affected by the program be consulted and given full opportunity to express their views and their desires), once the final decision on a value has been made, lower level management must be even more strenuous in defense of its standards than top management.

It is in many cases wiser to train lower level management to make the actual recommendations of standards—in other words, to train them in the scientific techniques of time study and work measurement, and let them recommend their own standards, rather than having them superimposed from the outside. However, for the company's protection it is imperative that objective outside experts either verify or set up the over-all standards and check on a test basis many of the detailed standards which are recommended by the supervisors.

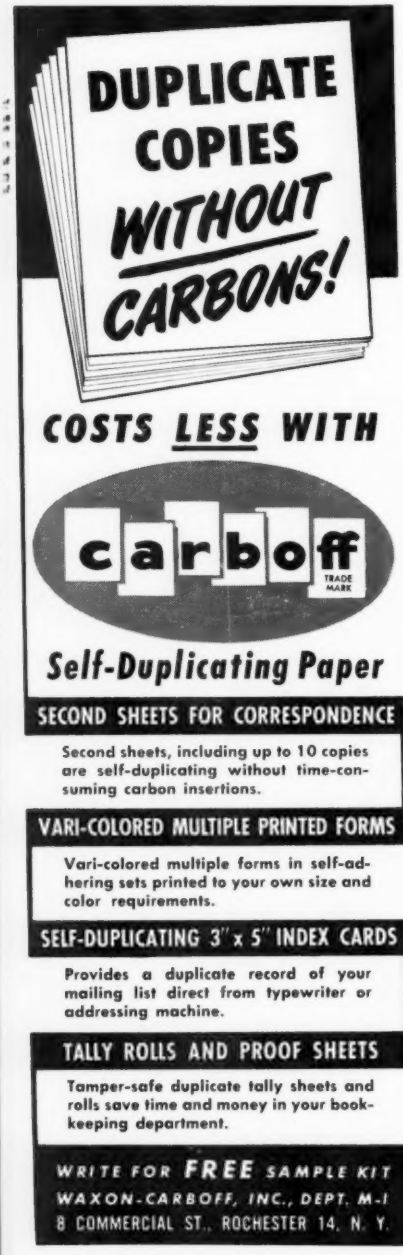
The action of letting the supervisors price their own operations will have won 90 per cent of the battle for top management. It will show people who, in many cases, have not been entrusted with important decisions, that the company values their skill and their honesty enough to entrust them with a decision as to how much their own work should cost.

The benefits of a properly planned and installed profit-cost control program are the same as those which originally built the American economy: every man has the opportunity to be his own boss and to be in business for himself.

Morover, profit cost control in the office brings automatic benefits to the company. It not only makes it possible for management to spot problem areas quickly; it also gives every department in the company the best possible incentive to continually improve its performance. It thus acts as a mechanism which induces continual self-improvement in all company areas, as well as a device which instantly signals top management if any department is failing in its performance, or not doing as well as most other areas in the company.

But PCC also has the accompanying danger that the collection of individuals who are their own bosses will not work out as a team for the benefit of the total organization.

This danger can be overcome by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careful and expert planning and action. The rewards, both in the way of company profit as a whole and ease of mind for top management, can far override the risk involved. With the profit-cost control type of approach to management control at all levels, your overheadache can be cured without having to remove the patient's head in the process.

Information—

(*From page 43*)

five categories contain only the essentials he needs for his work. Let's see that he has knowledge of where any additional information he may need in particular circumstances can be obtained, and let's then leave him to do this work unhampered by a great deal of unnecessary and extraneous reading. Let's make it unnecessary for him to go through voluminous reports for the particular facts that are of real importance to him. Let's do the same thing with each of our other company officers.

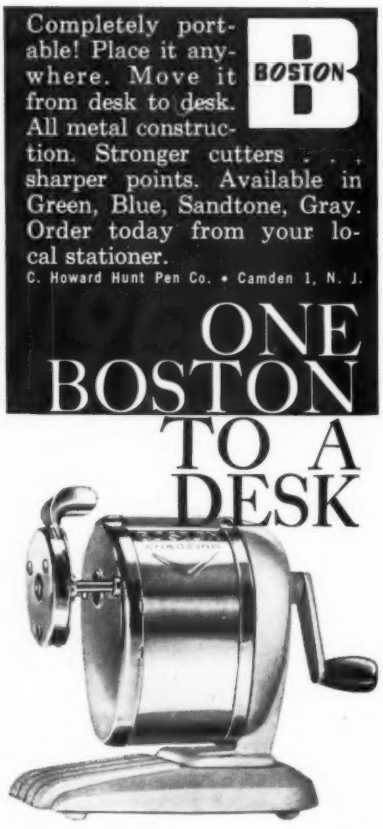
Then we would move onto the level directly beneath the top, where information coming up from subordinate levels is consolidated for the top level. On the basis of what we have learned of top executive needs, we would consolidate reports radically here. We would eliminate everything that is actually superfluous for top management, and make certain too, that reports which are of interest to the sales vice-president, but of no concern to the corporate secretary, are eliminated from the secretary's list.

Second level needs checked

With this pruning and consolidation carried through at the level immediately below the top, we can find out then what streams of information executives at the second level actually need for the consolidated reports they must relay to the top, as well as for their own day-to-day operating responsibilities. We repeat the process of elimination here, and then proceed to the next lower level prepared to reduce further the work done there.

This process, carried through each succeeding level down the hierarchy, offers, besides the possibility of eliminating many totally unnecessary reports and forms, the potential at each step of eliminating written communications, in favor of some faster and less cumbersome method of communication. Suppose we do reduce the sales vice-president's list of essential information to five basic data groups. This can automatically reduce the total amount of information he will receive. But if we continue to give him his five basic data categories in written form, we are still, at the lower management levels, causing someone to fill in forms, make copies, prepare written reports. Why not employ the principles of management by exception—set up control limits on the operations in which the sales vice-president is interested, and report to him verbally for each time period when the operation is proceeding within the normal limits? Written reports could be reserved for the exception — the point where for some reason the operation involved is not proceeding normally, where costs exceed budget, or come in far below the estimates.

Again the paperwork burden would be cut. Even more important, the signals for action when an operation is not proceeding according to plan would be far more apparent.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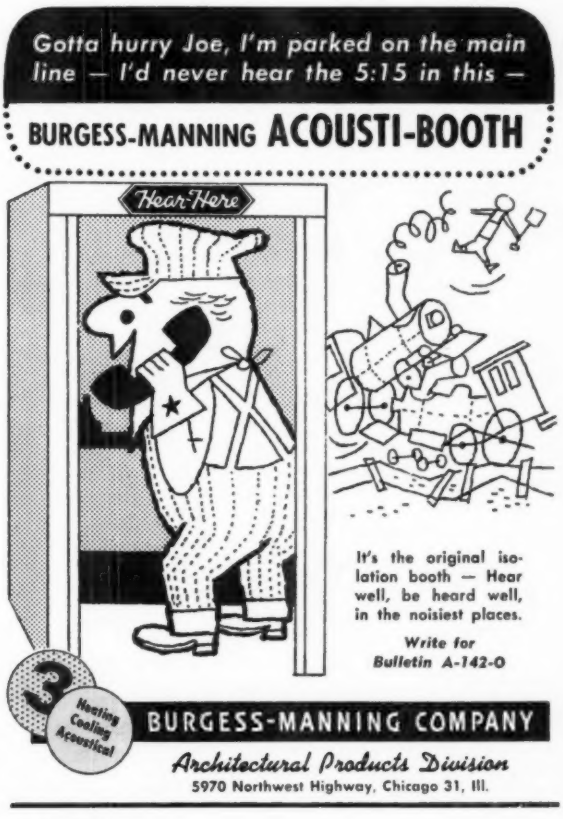
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The possibilities of such an entirely fresh approach to the office's paperwork burden are endless. For instance, why is it necessary that reports, made on dictating equipment by personnel who are out-of-town, be transcribed into written form when they are received at the home office, before being presented to the executive for whom the reports are intended? Why not simply let the executive listen to the recording? He gets the same information, he gets it faster, and one less typing job is required in the typing pool (and there are no copies to fill the files).

Today, we can dial a phone number and get the exact time, the latest weather report, baseball scores, directory information, etc. Why can't we follow this principle in our own office operations? Why can't we dial a number to receive automatically or by recording the latest information on sales, on inventory, sales expense items, etc.

We have the technology available to us—all it takes is a little imagination and practical application.

The same principle of substituting simpler, faster, and less troublesome communication media for written reports can also be applied at points in a system where written reports are eventually essential. For instance, some companies which formerly employed timekeepers in their factories to record individual workers' time on and off any given job have recently replaced the timekeepers with a network of intercoms spotted through the factory area. As a worker begins or finishes a given job, he calls in his clock and job number to a central control point where it is recorded on tape. The information is eventually transcribed to written form at the control point, of course, but one complete writing operation—and one job, that of the timekeeper—have been eliminated. Information that formerly was recorded in written form twice now is written only once. Similarly, many progressive companies are using the same principle to check incoming shipments at the receiving dock. Where formerly a clerk wrote out delivery of everything received at the dock, now a worker merely calls off into a warehouse intercom each shipment as it is received. The voice communication is recorded on a tape unit at a central point for eventual transcription. The worker, even as he "records," helps to unload the shipment.

Some companies have even carried this principle to the point where branch office reports to headquarters are made through dictated recordings which are used by the home office as the basis for consolidated reports. Thus, Kaiser Aluminum and Chemical Sales, Inc. in Cleveland, has all its branch offices submitting periodic sales statistics and reports on dictated recordings. This cuts clerical staffs to a minimum in the branch office, and does not increase the burden in the headquarters office since the former written reports were consolidated into summary reports there under the old system anyway. The written summary reports can be created just as easily from voice recordings as they can from written sales reports.

Similarly, an analysis of most accounts receivable operations will show that all basic information necessary for an invoice appears on the original sales order. Many companies, recognizing this fact, now merely add price information to the original sales order, which is created as a multiple part set or duplicating master, and mail a copy

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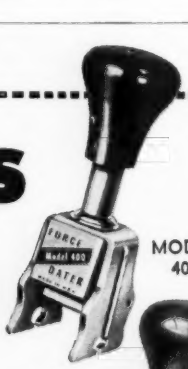

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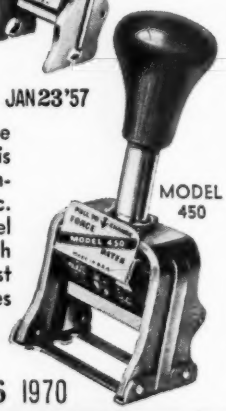

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of the sales order to the customer as an invoice. An invoice set, and all the work that goes into creating it, has been eliminated.

Thus, basically, the approach we are suggesting is two-fold: we suggest that each job in the company be analyzed in terms of the information required to do that job well, and that all non-essential information be cut off before it reaches the man or woman holding that job. And then we suggest further that the streams of information which are necessary be analyzed in terms of the possible media by which they could be carried, and that the paper medium be replaced by a faster, simpler method wherever possible.

And, in terms of the best way to carry through this analysis, we think it is logical, since we are starting from analysis of information needed to do each job, rather than pieces of paper in the existing system, that the top jobs be analyzed first, the secondary jobs next, and so on. In this way, reports that are needed up to a certain level, but are not needed beyond that point will automatically be cut off at the right stage. Many other reports will be eliminated altogether. Obviously, if we replace written communication with verbal or visual communication wherever possible, we are achieving forms reduction, even in the instances where the information formerly carried on forms is necessary to some positions in the company. And, by reducing each position to the categories of information it actually requires, we eliminate whole areas of unnecessary duplication of information.

But a word of caution is necessary in this approach: the analyst will not make much progress if at each stage of his information requirements study, he asks the person concerned "Do you really need all this information you've been receiving?" The normal human tendency, inspired partly by caution and partly by the demands of the executive ego, will be to assert that every bit of data received is absolutely essential.

The productive approach is to ask each executive, "What do you do with this information?" in terms of each report he is receiving. He can't simply answer without thinking, as he can when asked if he needs the information in question. And, once he thinks about it for a moment, he's usually prepared to admit, of non-essential information, that he really could live without it. As a matter of fact, he hasn't much choice; it's difficult to invent a valid use for information which is, in fact, not used at all.

A good analyst, because of his experience and because of his "across departmental lines" knowledge is not only in an advantageous position to raise important questions, but is also able to help arrive at valid answers.

Some may object that such a drastic reduction of the quantity of information reaching various operating levels would hamper each level in its work.

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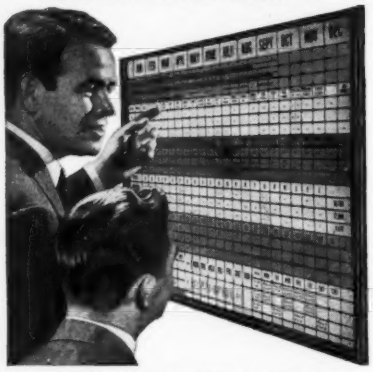

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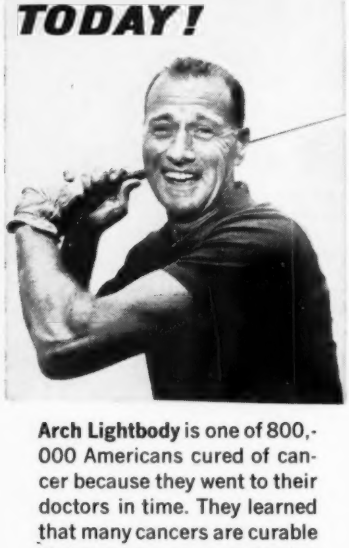

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American Cancer Society

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But we feel experience proves the reverse to be true. The mere existence of a stream of statistical data on sales, inventories, production, finances is not enough for sound management control. It can, in fact, hamper good control since management can be completely "handicapped" by the paperwork load and waste valuable time searching out the information it really needs. As long as the actual information needs of each level of authority are carefully and scrupulously determined, and provision is made for each level to get the information it does need promptly and in sufficient detail, management efficiency will be improved by reducing the quantity of information to be dealt with. No manager has ever complained that he wasn't getting enough paperwork over his desk. But he continues to complain about timeliness, gaps in his information, and the need for more pertinent information.

"Safety factor" can be added

A safety factor can be built in, for the rare occasions when an executive needs information which he does not ordinarily receive under the streamlined program we propose. As long as he or his secretary has a guide to the information streams reaching other executives at his level, he can simply call the appropriate person, the one who regularly receives the information which he temporarily requires, and learn what he needs to know. Or alternatively, he can call the information center, records center or central files, and have it give him the required data.

The latter would probably be a far better procedure in a large company where many executives are each receiving different "information streams." This would presuppose that the central file room or records center as we have known it in the past would change its function and its purpose, or more precisely, would achieve its true function and purpose: to serve as a center for storage and retrieval of information. A simple guide within the records center—or information center—would be enough to enable that center to furnish any executive with current operating information which he does not receive in the ordinary course of events. If the vice-president for finance for some reason needs to know the exact sales of Product A for the preceding week, he would not have to pinpoint the particular report carrying that information and the executive reading it. He could, instead, simply call the information center, which could refer to its master chart, identify the particular report carrying this information, pull its copy of the report from the files, and read out the required information, or simply compute from source data the items of information needed.

Does this seem Utopian? Does it seem that the information usually requested from files is altogether too involved and lengthy to be taken over a 'phone or intercom? Sometimes it will be, and, of course, in such instances the actual written source documents will have to be drawn from the information center. But our studies have shown that the need for actual direct reference to written documents by the person using the information carried in those documents is the exception rather than the rule. Well over 90 per cent of the requests for reference in filing operations, record centers, or central files can be met by giving information over the 'phone.

We speak often enough and glibly enough of the revolution that has taken place in the media of communication. We all use the telephone, the dictating machine, the intercom, in our daily work. We are all familiar with television, facsimile transmission, and tape recorders. Yet the office, while knowing of all these things, has not even begun to exploit all the possibilities they present for easing the problem about which everyone complain—paperwork.

And perhaps it is the very dimensions of the problem presented by paperwork that have prevented us all for so long a time from finding the best solution to that problem. We have been so concerned with the multitude of reports, forms and memos flowing through our offices and over our desks that we have concentrated on cutting down the quantity rather than starting from the other end, and stipulating that we would use a written form or report only in instances where nothing else would do.

But if we always remember that our real concern should be information, not pieces of paper, that before we can really control paperwork, we must manage and control information, we will find that we have the formula for solution of most of our major paperwork problems—and have as well an operating principle that will serve to prevent similar problems arising in the future.

Program—

(*From page* 47)

4. How employees are paid and when.
5. Safety regulations and location of medical office.
6. Telephone extensions for fire and protection office.
7. Employee organizations, social and athletic activities.
8. A rough cutaway of the building, floor plan or map of major departments.
9. If pay increments are based on merit raises, when and how they are decided.
10. Policies on personal telephone calls, absences and tardiness.
11. Vacation information.
12. Cafeteria information and hours.
13. Outline of company products.
14. Names and titles of top company officers and, possibly, members of the board of directors.

6. *Reading racks.* Reading rack services (and there are several available) have grown up in the past few years as employers became more conscious of what their people were thinking. Some managements have found that, for a nominal fee, they could satisfy the thirst for knowledge on the part of employees.

Some years ago certain employers distributed reprints of magazine articles, important speeches, syndicated publications put out by employers' associations and other similar material.

Outside material offered

There were employees who resented this and the solution found was to place take-home booklet racks throughout the company. In each rack there were an assorted number of pamphlets on all kinds of subjects. There might be a booklet on dry fly tieing or do-it-yourself plumbing next to one on the American economic system.

The most popular subjects in these booklets deal with character, morale, health, and various leisure-time pursuits, which will help employees enjoy their off-hours.

Five of the top publishers supplying these booklets are:
The Dartnell Corporation, Chicago
Good Reading Rack Service, New York
Ticonderoga Press (A division of Christmas Club, Inc., New York)
Harper & Brothers, New York
National Research Bureau, Chicago.

In a survey made by the Policyholders Service Bureau of the Metropolitan Life Insurance Company, several well-known companies reported on the subjects most popular with their employees. Minnesota Mining and Manufacturing Company, for instance, said that interest ran high in sports, home workshops and human interest material. Personality and health material ranked second, with economics and Americanism third.

In a synopsis from the Good Reading Rack Service program, that company says its "service consists of 52 booklets a year, or one a week. They are divided into four categories: Economic & Social, 15-17 booklets a year or 31 per cent; Inspirational and Self-Help, 10-11 a year or 22 per cent; Health and Safety, 10-11 a year or 22 per cent, and Home and Recreation, 11-13 a year or 25 per cent. . . ."

Employees should make choice

Oftentimes booklets are chosen from services (from advance copies sent by the publisher) by a committee representing interested departments and employee organizations. If there is a union, a representative usually participates.

As a sidelight of the above, most reading rack publishers provide a periodic survey form. It can be an excellent guide to the committee or manager assigned to choose the booklets.

7. *Letters.* The language of letters has been of continuing interest to many companies, for some years.

Letters written by employees are, of course, of paramount interest to management. They define, more than any other form of communication, the corporate personality. If they are warm, friendly, easy to understand and well organized, the company's message gets across favorably. If they are written in technical English (although for legal reasons certain technical words often must be used) and commercial jargon, in a 19th Century manner (Yours of the 26th received and noted), the firm suffers.

8. *Daily news bulletins.* The larger the firm or office, the more likely it is to produce a daily news bulletin. One New York company provides an opportunity to get fast-breaking news out ahead of rumors. For instance last year on November 18 it announced that the office would be closed Friday, December 26, as well as Christmas day. This same company also makes announcements of general interest through this publication, runs a lost

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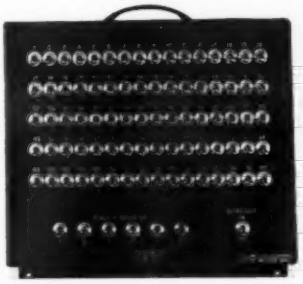

The Quikswitch 80-80 is a switchable plugboard for the IBM 514 or the 519 reproducer. It replaces the manually wired 80-80 board and provides column-for-column reproducing into blank cards or, at the flick of a switch, any desired column can be left blank or gang punched with constant data.
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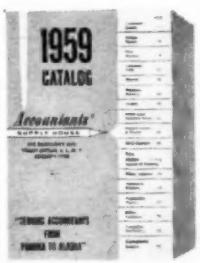

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Detroit 19, Mich.

and found column, announces employee organization meetings and sports events, and uses the publication to further charitable drives and blood bank donations.

Another company doing the same thing is the Skelly Oil Company of Kansas City, Mo. Its *Office Bugle* is a one-sheet affair, quite simple in format. It includes the latest news and announcements.

Some companies, by the way, go as far as printing the weather report. This is particularly easy to do if the bulletin is published late in the day, and it's useful to employees.

Of prime importance are announcements concerning working time, opening and closing hours, compensation, holidays, vacations and so on. Such a publication is also, however, an excellent method of noting personnel changes, appointments, promotions and transfers.

Because of the number of times it is published it's a good way to gazette lower-echelon promotions—steno to secretary, team captain to section head. This recognition can go a long way in making people feel more valuable. Some companies also use the daily news bulletin to announce the names, positions and duties of each new employee. It also takes care of that old bugaboo, the "personal notice."

Everyone in the office then knows the new person is there; he's made to feel more welcome and, of course, other employees know whom to see if a job must be done in a specific field.

This form of employee communication is undoubtedly the most economical to produce. Is there a firm that has no multilith or mimeo operation? The element of time calls for an internal production job on this, and the internal jobs are usually the cheapest.

If a Varityper is available it enhances the looks and format of the publication but it is certainly not essential.

It should be noted that many bulletins and newsletters do not publish every day. It can come out two or three times a week, or if there's enough news, it can publish five times a week.

The same principles must be followed in publishing a newsletter as in any other form of employee communication. If the material is there, put it out . . . if it isn't, it's a waste of time, effort and money. In other words, just because a newsletter *can* come out every day doesn't mean it *has* to.

It is only during the past 15 years or so that communications of the second basic type—inspirational communications—among the people on the payroll have become thoroughly accepted as a vital part of sound personnel administration.

Management has seen the internal communications field expand vastly. It has, as the National Industrial Conference Board in its *Studies in Personnel Policy, Report 136* points out: "created mutual understanding and confidence among people at all levels in the company. It releases willing effort and encourages teamwork. It is a powerful incentive."

The avenues of communication are available. They have been shown to be open. And they have proved to be effective and successful when properly used.

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ELLIOTT ADDRESSING MACHINE EQUIPMENT. Replaced by Tabulating System. Good Condition. 9 I.B.M. Stencil Writers; 11 Moisteners; Punch Machine; Inking Machine; 2 Addressing Machines; 2 Tape Machines; 66 100-drawer Cabinets. Write: Geo. J. Woodin, P. O. Box 2187, Tulsa 2, Okla.

FOR SALE: MODEL 5300 Dupligraph with 15 extra anvils to hold letters. Excellent condition. Price $1,200. Bancroft-Whitney Company, 55 Hyde St., San Francisco 1, California.

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Simply circle the respective numbers in coupon below

Just circle the numbers on which you want further information; fill in your name and address below, tear out and mail to Office Management. Our office will forward your inquiries promptly to the companies concerned.

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Office Management

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Close of a decade

editorial

THIS MONTH marks the beginning of the closing year of the 'fifties, of a decade that has seen momentous changes in the office. As the 'forties ended, automation in the office had not even been heard of. Overall systems planning —the concept of relating each of the office's processing responsibilities to every other, and evolving some meaningful pattern by which all the office's interdependent needs could be met in the simplest, most efficient work flow—was in a rudimentary state, although some particular specialties within the systems field were well understood. The personnel shortage, which had first become acute during the war years, remained still critical as marriage and birth rates continued to boom. The idea of tying office layout in with work flow patterns, while not new or unknown, was still the exception rather than the rule in the great majority of American offices. The principle of physically conditioning offices to produce better working conditions and, therefore, better work, was also just beginning to gain acceptance. The whole field of fringe benefits for office employees—paid life insurance, medical insurance, profit sharing or pension plans—was still relatively new.

Within the 'fifties, we have seen all these concepts, either new or unknown when the decade opened, become so thoroughly accepted a part of our working life that, even though they are not always applied, they are no longer questioned.

The 'fifties, too, have seen constant acceleration of a trend that first showed itself during the postwar years—the continuing growth of office and service personnel strength as compared with production line personnel. Today, the ratio of clerical workers to production workers is still rising, and in many manufacturing industries there are already more office personnel at work than there are production people. But perhaps the most important change that occurred in the 'fifties as far as the office is concerned, came as a result of a new management concept of the office as a functioning part of the company, playing as important a role in its profit picture as any other area of company operations. Moreover, management was in many instances learning that the "office," the headquarters, could, by proper use of the figures and information with which it dealt, play the most important role of all in determining the shape of the company's future. The office, so long considered a necessary evil, an "overhead" expense, by many businessmen whose own backgrounds had been production or sales, has, with the increasing importance of the long range planning function, become a focal point of management concern, interest—and dependence. The development of operations research techniques and the centralization of data processing and planning functions in computer centers, have of course, emphasized this new management realization.

The office, in summary, has come through a period of tremendous growth and development during the 'fifties. Its growth has in many ways outstripped its development. In spite of the increasing knowledge of the things that could be done to make the office more efficient, more economical, and more valuable to the company which it served, the pressure to meet an ever-increasing work load has caused many improvements to be postponed. Thus, in spite of the fact that so much was being learned about the office, in spite of the vast improvements some companies were making in their paperwork routines, many companies still were content to improve their machines and add more people, without any fundamental changes or improvements in the way the work was done. And, precisely for this reason, the office, even with the new attention that has been focussed on it in the past years, remains today the area which offers the greatest room for improvement in company efficiency—and operating economy.

This is perhaps the main mission of the office during the years ahead. It is no longer the poor relation in the business structure. It is, instead, the main center of business activity. The successful office will be the one that recognizes the importance of its role, and that meets its major challenges—as well as its everyday work—with the assurance that it can learn to handle every extraordinary situation, and continually improve its performance in the routine—as long as it remains flexible, responsive, and determined that its thinking and planning shall never become rigid—or complacent.

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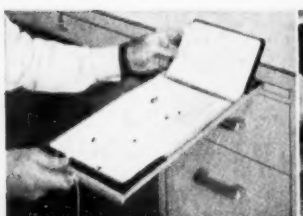

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